ISSN 0260-5805

THE BRITISH HERPETOLOGICAL SOCIETY

BULLETIN

No. 9 June 1984

BRITISH HERPETOLOGICAL SOCIETY

c/o Zoological Society of London
Regent's park, London NW1 4RY

Correspondence, membership applications, subscription renewals and purchase orders for the British Journal of Herpetology should be sent to the above address.

The British Herpetological Society was founded in 1947 with the broad aim of catering for all aspects of interest in reptiles and amphibians. Initiated by a small number of enthusiastic and well-known naturalists, including the first President and author of the standard textbook on British herpetofauna Dr. Malcolm Smith, the Society expanded rapidly and today enjoys national status with many international connections.

Activities of members range over a number of interrelated fields. In many cases the prime interest is in maintaining, breeding and observing various species in captivity and the Society acts as a forum for the interchange of experiences in this area. Others are concerned with the observation of animals in the wild state. There are active sub-committees which help to cater for these various tastes, notably the Captive Breeding Committee and the Conservation Committee. The former encourages the development of effective breeding techniques for captive specimens, thus providing animals for observation and study in vivaria, and for conservation purposes, while simultaneously reducing the need to take fresh stock from wild and possibly declining populations. The Conservation Committee is actively engaged in field study, conservation management and political lobbying with a view to improving the status and future prospects for our native British species. It is the accepted authority on reptile and amphibian conservation in the U.K. and has an advisory role to the Nature Conservancy Council (the statutory Government body). There are also professional scientists within the ranks of the Society engaged in increasing our understanding of all aspects of reptile and amphibian biology.

Publications

British Journal of Herpetology, published each June and December, contains papers or original research in herpetology.

British Herpetological Society Bulletin, also published each June and December, contains notices, news items, articles and original papers on all aspects of herpetology.

The Care and Breeding of Captive Reptiles, a new book containing a collection of papers on recent developments in breeding reptiles in captivity. This publication is not included in members' subscriptions, but is available to members at a price of £3.00. Applications to purchase should be made to the Chairman of the Captive Breeding Committee.

Meetings

About ten meetings covering a broad sphere of interests are held each year.

Subscriptions

Ordinary Members £10. Junior Members £3.00 (Junior Members do not receive the British Journal of Herpetology). Institution rate £17.
All subscriptions become due on the first day of January each year.

The Society does not, as a body, hold itself responsible for statements made or opinions expressed in the Bulletin; nor does the Editorial necessarily express the official opinion of the Society.

The Bulletin is edited and produced by
Simon Townson and **John Pickett**

Contributions and correspondence arising from the Bulletin should be sent to:
John Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW

REMAINING MEETINGS 1984

The meetings are held in the Lecture Theatre in the Linnean Society of London, Burlington House, Piccadilly, London W1 and start at 7.00 p.m. unless indicated otherwise.

OCTOBER 13th — *(postponed from September 29th).* A special Saturday meeting organised by the Captive Breeding Committee, to be held at the Centre for Life Studies, Regents Park. See below for full details.

OCTOBER 26th — Mr C.J. Raxworthy (Department of Zoology, Beford and Royal Holloway College, Univ. London, Egham, Surrey). Herpetofauna of S.W. Morocco — results of a University of London Union Natural History Society Expedition 1983.

NOVEMBER 21st — Mr M.P. Simmonds (Department of Zoology, Westfield College, Univ. London). Ecology of the feral African Clawed Toad (*Xenopus laevis*) in Britain.

OCTOBER 13th 1984, SPECIAL SATURDAY MEETING

To be held in the lecture theatre of the Centre for Life Studies in the N.W. corner of London Zoo. **Entrance in Prince Albert Road, opposite Ormond Terrace.**

Programme

17.00—18.00 Arrival, refreshments and informal discussion.

Chairman: Dr S. TOWNSON

18.00 Mr ERNIE WAGNER (Curator of Reptiles, Woodland Park Zoological Gardens, Seattle, U.S.A.): Breeding Dendrobated Frogs at Woodland Park Zoo.

18.30 Mr ERNIE WAGNER: Husbandry and Breeding of Colubrid Snakes.

19.30 Mr ANTON VAN WOERKOM (Dutch Snake Society, Holland). The Italian Snake Festival.

20.15—21.15 Refreshments and informal discussion.

CORRIGENDA

The table on page 45, *Bulletin 8* (D. Billings: The Common Frog *Rana temporaria:* some notes on its successful husbandry and breeding). should have read:

Number of adult frogs returning to spawn

1978	1979	1980
6 males, 2 females	8 males, 4 females	15 males, 7 females

FINANCIAL STATEMENT 1983

The excess of income over expenditure during 1983 amounted to £543 compared to £188 in 1982 (income exceeded expenditure by £281 in 1981). Had there not been a substantial increase (25%) in Ordinary members of 103 (=£1030) during 1983, the deficit would have been far greater. Publications were the Society's biggest expense by far and were £1742 greater than in 1982, this was followed closely by an increase in postage.

On account of the Society's financial state, the Conservation Committee only received a grant of £376 compared to £1075 in 1982. Based on the trends during 1982 and 1983 a larger excess of

expenditure is predicted for 1984, thus leaving no other choice than to increase the subscription. The only contact many members have with the Society is through our publications so any reduction in their size would not be desirable. It was the intention in 1983 to publish the Bulletin quarterly, but in no way can this now be done.

Monica Green, Treasurer

INCOME AND EXPENDITURE ACCOUNT 1983

	£	
Subscriptions	5344.80	
Sales of Journal	3613.29	
Deposit a/c interest	30.45	
Miscellaneous sales	226.79	
		£9215.33
EXPENSES		
Printing of Journal & Bulletin	7826.47	
Postage and stationery	1148.99	
Hire of meeting rooms	275.00	
Conservation committee	375.57	
General expenses	10.00	
Advertising	62.18	
Bank charges	60.02	
		£9758.23
Excess of expenditure over income		£542.90
ASSETS		
Cash at bank		
Current a/c	1604.61	
Deposit a/c	491.69	
		£2096.30
LIABILITIES		
Pre paid subscriptions	256.15	
Chairman's expenses	32.13	
Captive breeding	125.57	
Facsimile	372.65	
Junior herps.	40.50	
Secretarial expenses	31.43	
		£858.43

Balance 31.12.1983. £1237.87.

THE FIRST MALCOLM SMITH DINNER OF THE BRITISH HERPETOLOGICAL SOCIETY

Hosted by the President of the British Herpetological Society, the Earl of Cranbrook, the first Malcolm Smith Dinner (named after the founding president) was held on Friday, 16th December 1983 in the Peers' Dining Room, House of Lords, Westminster. Besides the President's personal guests: Dr R.F. Inger (President of the Herpetologists' League, U.S.A.) and Mrs Inger, and Miss A.G.C. Grandison (Head of the Amphibian Section, British Museum (Natural History), London), the other guests (BHS members) comprised: Dr and Mrs Roger Avery, Prof. Angus d'A. Bellairs, Dr H.R. Bustard, Mr Keith Corbett and partner, Dr J.F.D. Frazer, Dr S.P. Gittins, Dr R.A. Griffiths, Mr J.D. Harrison, Prof. and Mrs Geoffrey Haslewood, Dr and Mrs Konrad Klemmer, Dr and Mrs Michael Lambert, Mr T.E.S. Langton,

Mr and Mrs James Pether, Mr J. Pickett, Mr and Mrs Andrew Stimson, Dr Ian Swingland and partner, and Mr and Mrs Victor Taylor.

Before the dinner, Lord Cranbrook took his guests on a brief tour of the House of Lords, showing the throne where the Queen presides over the Opening of Parliament and the main room in the Lords (the Commons having declined) where President Reagan gave his historical address to the two Houses in 1982 with murals to either side depicting scenes from the Battle of Trafalgar and Waterloo. The party then continued to the Peers' Dining Room with its splendidly gothic decor. After drinks at a reception, the thirty diners then sat comfortably at either side of a long central table.

MENU

Fish Quenelles in White Wine Sauce	Club Prestige (Brut)
Guinea Fowl Macarthur Petits Pois Paysanne Byron Potatoes	Curvee Vercherre NV
Coup Delice	Sauternes (A. Lucier)

Coffee

Brandy or Port

Toasts: 1. The Queen. 2. The British Herpetological Society.

Speeches: Lord Cranbrook gave his Presidential Address to the Society. An abstract of the speech given by the President follows:—

"The BHS is just about 37 years old. This is a rather indefinable anniversary, but perhaps we can celebrate it as the 12th prime number of existence, and start to lay plans for the fifth decade! To establish a baseline, I shall briefly compare BHS with other British learned societies in the zoological realm with which I have experience. At the same time I shall mention some of the developments I see coming.

Present membership (including junior members) remains below 800; this places BHS among the smaller national societies. Management structure involves a Council with overall responsibilities, as is usual, and three subordinate Committees which organise much of the Society's activity in areas of special responsibility:— Conservation, Captive Breeding and Education. Recently, Council decided that each of these Committees should operate under approved terms of reference. Those for the Conservation Committee have been published (*Bulletin* 7, June 1983); those of the other two committees are being formulated. I believe that this degree of regulation is needed and that it will not hamper the freedom of action of Committees. Other learned societies do not all face similar organisational complexities, in many cases having a less catholic range of interests. In ornithology, for instance, there are separate national societies devoted to the academic discipline, to conservation and to captive breeding, respectively.

BHS issues serial publications at three recognisable levels of content: the scientific in the *British Journal of Herpetology*, social and general in the *Bulletin* (which replaced the Newsletter in 1980) and educational in *J. Herps. Newsletter*. In this variety of publications BHS output is not unmatched (e.g., Mammal Society), but it is nonetheless ambitions, and perhaps vulnerably dependent on the voluntary effort of a handful of members.

BHS members have the opportunity to attend monthly meetings. Most are held in London, but some elsewhere, usually in association with another group or regional society. The Society also promotes symposia, generally in co-operation with another organisation. The most recent was, of course, the joint BHS/British Veterinary Zoological Society meeting held in October at the Centre for Life Studies, Regent's Park and earlier in May, 1983, the joint BHS/Anatomical Society/Zoological Society of London Symposium on reptile biology, in honour of Prof. Angus Bellairs, that was held at the London Zoo. The proceedings of such symposia are ordinarily of sufficient standard to be published. In this respect, I believe that BHS has as good a record in promoting its specialist science as any equivalent learned society. It might be suggested that BHS

should follow the example of some others in holding an annual residential conference. Personally, I fear that a regular commitment of this sort could overtax resources and lead to a deterioration in the quality of papers. I therefore believe that BHS symposia should continue to be *ad hoc*, or 'occasional' in nature.

It is important to ask: does BHS have the support of all those in the U.K. who count themselves as professional herpetologists? We are indebted to Michael Lambert for a compilation of herpetological research at British Universities (*Bulletin* 7, June 1983). There is activity at Aberdeen, Bristol, Kent, Leeds, Leicester, London (Birbeck College), Nottingham, Open University, Oxford, Sussex and UWIST, also London (Westfield College) and U.C. North Wales (Bangor and Menai Bridge). I understand that we can look forward soon to a report on the research work in the British Museum (Natural History). I believe that there are BHS members in all these centres. I hope that every active scientist will wish to join the Society in order to give it support and make it genuinely representative of herpetology in this country. Existing BHS members should encourage their colleagues to join.

It must be recognised that, in the United Kingdom, BHS is not the only society with herpetological interests. BHS has good relations with its fellow societies (listed in another of Michael Lambert's useful contributions in the *Bulletin* for June, 1983). But it is essential to extend the strength of our own Society more evenly through the country. At present, Council hopes that Brian Banks will be able to set up the first regional group among BHS members in northeastern England. It has been resolved that any functioning group may propose a representative to be co-opted onto Council.

Through the Captive Breeding Committee, BHS plays a strong role in promoting the care of amphibians and reptiles in captivity. This is important, not only in terms of animal welfare but also because of its implications for species conservation.

In academic circles, the Society is judged by the quality of its publications, notably the *BJH*. Under the present Editor, it is gratifying to see an increasing inflow of submissions of a high standard. But the fruits of success bring extra demands on his time and energy. Moreover, publishing is expensive and the costs show no sign of diminishing. The *BJH* is a major commitment in the Society's budget, and I commend Roger Avery for the steps he is taking to ensure financial security without the loss of editorial control.

The Society has an essential role to play in the national effort to conserve the native herpetofauna. We are grateful for the charitable support that has made it possible to appoint Tom Langton as Conservation Officer. I am sure he will organise the efforts of the Society into effective areas of practical conservation. Already much is done, all of it entirely voluntarily.

With responsibility for so many and varied plant and animal groups, habitats, etc., NCC cannot be expected to employ a large staff of specialised herpetologists. BHS has always been ready to offer its services as the counter-part n.g.o. BHS was invited by NCC to comment on the document, 'Ecology and conservation of amphibian and reptile species endangered in Britain'. BHS members are productive in field research into endangered and protected species, essential for sound conservation management. The preparation of the free leaflet, 'Wildlife and the law, no. 2: Reptiles and amphibians', reflects credit on the Society. The NCC has now circulated a further discussion document, 'Objectives and strategy for nature conservation in Great Britain'. If BHS is to comment, I feel that strong arguments should be proffered for expanded autecological studies of all protected species (remembering that, under the Wildlife and Countryside Act, 1981, all native amphibians and reptiles are in fact on the protected list).

BHS influence in continental Europe operates mainly through personal contacts. Many members are involved in the study of European species at continental localities. Keith Corbett is BHS's official representative on SEH, and contributes greatly in this role. BHS is also able to create links outside UK through the conferral of Honorary membership on distinguished foreign herpetologists.

BHS must also seek a wider role in international herpetology. One obvious area where contacts already exist, and can be strengthened with comparative ease, is within the Commonwealth. The exact nature of BHS involvement needs to be explored. Michael Lambert and I have already put some thoughts on paper, and offered them for comment to the Scientific

Adviser to the Commonwealth Secretariat, Professor Jose Furtado, a limnologist on secondment from the University of Malaya.

Of special topicality at this moment is the first World Congress of Herpetology, which — as now begins to seem possible — may be held in Britain. The role of host could place heavy demands on the Society, which I feel must be resisted unless proper funding can be found. We have ourselves received an invitation from Dr Kraig Adler to contribute towards the costs of the Congress. This I feel BHS must do. Dr Adler proposes a levy of 1 Dutch florin (£0.23) per member. My personal inclination would be to offer at least this sum, and couple it with a general subscription rise, which is inevitable if the Society is to continue to function to members' satisfaction.

Financial strictures at present are acute, and more money is needed for the management of the Society. After ordinary administrative costs, too little remains for the activities of the Committees or for publications. For instance, the plan to issue the *Bulletin* quarterly (announced in No. 6, December, 1982) has had to be postponed *sine die*.

It must be the duty of Council to formulate plans for long-term security. The management of the Society remains at risk so long as it depends on the goodwill and hard work of a small handful of people. At present this is undoubtedly the case. The membership owes a great deal to the dedicated few. Let us toast thanks to them and prosperity to the British Herpetological Society."

Dr Inger replied briefly to the President's speech in his capacity as President of the Herpetologists' League in the U.S.A. outlining his shared experiences when working with Lord Cranbrook in Malaysia.

The occasion was much enjoyed by participants and a notice recording it appeared under 'Dinners' in the 'Court and Social' of *The Times* the following day. Apart from being a social event, it is hoped that the first Malcolm Smith Dinner will help to establish herpetology as a notable discipline in Britain (and for that matter elsewhere in the Old and New World) as certainly enjoyed by entomology and ornithology, as well as by mammalogy.

TERMS OF RERERENCE FOR THE EDUCATION COMMITTEE OF THE BRITISH HERPETOLOGICAL SOCIETY

1. Appointment

The Education Committee is appointed by Council under Rule 10.

2. Aims

a) The primary aim of the Education Committee is to enable children between the ages of 9 and 17 who have an interest in herpetology to develop their interest with particular regard to improving their field and husbandry techniques based on the platforms of sound conservation.

b) The secondary aim of the Education Committee is to communicate with non-members of all ages in order to bring about an awareness of the work of the Society and to generate a general sympathetic interest in all aspects of herpetology.

3. Composition

a) **The Education Officer:** Chairs the Committee and represents it on Council. Is responsible for the overall running of the Committee and for the production of the termly Junior Newsletter.

b) **An Administrative Secretary:** To be a member of the Society who assists the Education Officer in matters of routine administration. Is responsible for the production and distribution of Education Committee Minutes.

c) **A Primary Specialist:** To be a member of the Society who has experience as a primary teacher. Is responsible for the development of activities in primary schools.

d) **A Secondary Specialist:** To be a member of the Society who has experience as a secondary teacher. Is responsible for the development of activities in secondary schools.

e) **A Veterinary Specialist:** To be a member of the Society who is qualified M.R.C.V.S. To have special responsibilities to provide the Committee with professional and ethical advice in connection with the advisory function of the Committee to children and teachers.

f) **General Advisers:** Up to a maximum of five persons whose interests, or experience, or expertise enables them to help the Education Committee achieve its stated aims. General Advisers need not be members of the Society.

4. Personnel Appointments

a) The Education Officer is appointed under the Rules of the Society (ref 5 e and g).

b) The Administrative Secretary and all of the Specialists shall be appointed by the Council of the Society following proposal by any member of the Society but subject to approval by a majority of Council members present.

c) General Advisers can be nominated by any member of the Society but can only be appointed by a majority decision of the Education Committee.

5. Powers

In order to achieve its aims the Education Committee is empowered by Council to:

a) continue running the Junior Section of the Society.

b) extend Junior Section activities to involve school groups and teachers in both the Primary and Secondary sectors.

c) establish a panel of members of the Society to provide speakers for non specialist groups.

d) undertake general exhibition work on behalf of the Society

e) publish any material on behalf of the Society that is considered to be supportive of the aims of the Education Committee provided that such publications have been approved by Council.

f) be represented by a non voting observer at all meetings of all other committees and sub-committees appointed by Council.

g) be responsible for its own accounts through its own bank account.

6. Funding

a) The Education Committee is empowered to raise funds through Junior Section subscriptions, the level of these being decided by the Education Committee and reviewed as necessary.

b) The Committee may seek additional funds from external sources and may also be allocated funds by Council.

7. Expenses

a) Subject to the availability of funds and the consent of the Education Officer, members of the Committee may claim from the Education Committee the costs of postage and telephone calls incurred on the business of the Committee.

b) A discretionary grant towards travel expenses may also be payable on application to the Education Officer.

8. Meetings

a) A minimum of two meetings a year will be called by the Education Officer.

b) Notice of meetings will be sent to all members of the Education Committee, to the Secretary of the Society, the Chairmen of all Committees and Sub-Committees appointed by Council and to any individual members of Council who request notification.

c) All other Committees appointed by Council have a right to send a representative observer to any meeting of the Education Committee.

d) Ordinary members of the Society may apply to the Education Officer for permission to attend meetings as observers. Permission will be granted at the discretion of the Education Officer.

e) Provided that a quorum of three members, other than General Advisers, are present a set of minutes will be produced for each meeting. A copy of these minutes will be made available for Council inspection at the first available meeting of Council. Any member of Council is entitled to receive their own copy of the minutes by prior notification to the Education Officer.

9. Accountability

a) The Education Committee is required to present a report at each AGM of the Society. This report must include the following items:

i) a full list of Education Committee members.

ii) a statement of all activities undertaken in support of the stated aims of the Committee.

iii) a statement of the present status of the Junior Section.

iv) a financial statement of the Education Committee accounts audited by an independant auditor approved by Council.

c) The Education Committee is required to present a summary of the annual report (item 9b) for publication in the post-AGM edition of the Bulletin.

10. Commencement

These Terms of Reference were approved by Council on 18th January 1984.

REPORT OF THE CHAIRMAN OF THE CONSERVATION COMMITTEE FOR THE YEAR JANUARY 1st 1983-84

As well as advising BHS members and others on matters concerning conservation, the chief duties of your Committee are (a) to understand as far as possible the distribution and status of the populations of all species of amphibians and reptiles existing in the wild in the U.K., (b) to carry out and promote such management practices as will preserve and enhance indigenous populations and a few of European continental origina and (c) to take part in other activities that contribute to herptile conservation. I review the Committee's work for the year 1983-4 under these headings, with some overlap.

(a) *Monitoring.* Concerning the rarest of British herps, namely the Natterjack toad, Sand Lizard and Smooth snake, the most significant recent development has been the publication of *The ecology and conservation of amphibians and reptile species endangered in Britain* by the Nature Conservancy Council (NCC) (available from the Interpretative Branch, NCC, Attingham Park, Shrewsbury SY4 4TN: £5, post free). This 91-page Report was compiled in 1983 by a 16-strong working party set up largely at the instigation of the Wildlife Link Committee (Link) and including three members of your Committee. It is probably the most detailed and comprehensive review ever published of the natural history and status of these animals in the U.K. It will be an indispensable source of information for several years at least and it also contains recommendations for conservation that can be and already have been used to counter threats to the species. A case in point is the continual destruction of sand dune habitats for the Natterjack and Sand lizard races still surviving in the Southport region of Merseyside. The Sand lizards here are different in appearance from those found in southern counties; it is therefore important to preserve this remnant race. (Indeed, studies of the genetic differences between isolated populations of European herps are long overdue). At the end of April 1983, 7 Committee members paid a visit to the area, saw dune lizards and Natterjacks and on May 1st met NCC representatives at the Ainsdale National Nature Reserve (NNR). One useful result was that, later, BHS was permitted to take Sand lizards and their eggs from the outside vivarium in the NNR for breeding in Mike Preston's vivarium near Guildford. John Newton of Derby, who visits the area regularly and who has joined BHS and your Committee, brought adults and 35 eggs to Mike's vivarium in early July; 33 eggs hatched during late July and August and John liberated 22 juvenile lizards on dunes in the Southport region in early September. One was seen there in late October. This is an example of a breeding-release programme carried out each year under NCC licence by Committee members, four of whom (Trevor Beebee, Keith Corbett, Mike Preston and Jon Webster) have large outside vivaria planted to express on a small scale the dry sandy heathland conditions that are the chief Sand lizard habitat in the U.K. containing small balanced populations of the reptiles with, sometimes, Natterjacks. Animals from "doomed"

sites, in Dorset especially, are collected (under licence) and used for breeding; the young are liberated in suitable areas, usually with past records of but no current populations. Introductions have, so far, been most successful as shown by the later monitoring required under the conditions of the licences. Care is taken to keep apart populations with obvious or presumed considerable genetic differences.

Your Committee is far from satisfied about what is done or planned to protect the rare herps in the Southport area. In January 1983, it had a special meeting to discuss at length a proposed golf course for which BHS support had been canvassed. The first plans were rejected by a small majority, but a modified scheme was eventually accepted and Keith Corbett empowered to negotiate with the developers.

Four Committee members, namely Brian Banks, Trevor Beebee, John Buckley and Tom Langton have been and are very active on behalf of Natterjacks. Trevor's book *The Natterjack Toad* (Oxford University Press, 1983) is a comprehensive monograph including a chapter on conservation that outlines the present status of and threats to this animal. A detailed Report *Natterjacks in Britain, 1983* was prepared by Arnold Cooke (herp export on the NCC's Chief Scientists Team and a BHS member), Brian Banks and Tom Langton. The Report, widely circulated but not formally published, gives details of Natterjack status in all areas in which they are known.

John Buckley and Tom Langton, with the help of 8 other observers including Arnold Cooke and Mark Jones, also a Committee member, submitted an even more detailed account of the Norfolk Natterjacks. Against the objections of the Norfolk Naturalists Trust (NNT), of the World Wildlife Fund (WWF) and, to a limited extent, of the NCC, the North Norfolk District Council issued planning permission for up to 75 touring caravans on a site about 200 yards from one of the two remaining inland Natterjack colonies in the U.K. Your Committee, with the support of the NNT and WWF U.K., appealed to the Department of the Environment against this permission on behalf of BHS. Our appeal was acknowledged in September 1983, a reminder in January 1984 produced no decision and we await the final result.

Brian Banks completed his research project, largely supervised by Trevor Beebee and financed by NCC, at the last remaining Southern Natterjack colony. A main purpose of this work is to try to discover the reasons for the catastrophic and quite recent decline of Natterjacks on this type of heathland habitat. Acidification of breeding pools is certainly one factor but it is not the only one and other (possibly chemical) causes remain to be discovered. Trevor has drawn up a continuing scheme for encouraging this colony and hopes for further BHS help.

In 1983, Arnold Cooke asked BHS to undertake a 3-year financed survey of the status of the Smooth snake, confined in the U.K. to Surrey, Hants and Dorset. A 14-strong team was formed and the exercise, code-named CAT (*Coronella austriaca* Team), has now begun: progress will be reported in future years.

Rare reptile monitoring in the South continued from March to October 1983. In this BHS is particularly lucky in having members living close to dry heaths. In Dorset, Dave and Marion Dolton make prolonged studies of sites and submit annually a detailed report of what they find. In 1983 they reported on 82 sites of which they visited more than 50. Their holiday, set aside for monitoring, coincided with the hot dry spell with (for them) disappointing sightings of reptiles. On some visits, Trevor and Maggie Beebee, Keith Corbett and Tom Langton joined the Doltons. As a result of all this and its recording, and of the previous pioneering work of Committee members, BHS has probably the most detailed and thorough understanding of the vital Dorset rare reptile sites now available anywhere. Of course, commoner reptiles and amphibians are also surveyed and recorded in this country. In Surrey and Hants Tony Braithwaite, a quite recent recruit to BHS and the Committee, has proved to be a star reptile spotter. Living close to some of the best remaining dry heaths, he is frequently able to visit these and has found rare reptiles in places where no recent records exist. His own records are precise and invaluable. Other Committee members took part in the surveys including John Newton, who used his holiday for this: many of us regard looking for reptiles on sunny days as the most pleasurable BHS activity.

A BHS member, Mark Nicholson, based at Leicester Polytechnic, is carrying out a nation-wide survey of Great Crested newt sites, financed by NCC. Keith Corbett and Tom Langton are

making detailed studies of amphibians in ponds in the London area: Tom, financed by the GLC and in collaboration with the Fauna & Flora Preservation Society, is concerned with about 1000 ponds. This work may save a fair proportion of London's amphibians: it is well assisted by Bill Whitaker, also of the Kent Trust for Nature Conservation. Keith is Chairman of the London Wildlife Trust Conservation Committee and presses for action to save ponds.

In Suffolk Mark Jones makes a survey and reports annually on the herps, as far as his circumstances allow: he gives lectures, distributes BHS leaflets and is breeding Natterjacks. In Wales, Richard Griffiths is making a survey of amphibians from his base at the Llysdinam Field Centre, Powys, and also reported on ponds in Herts. Chris Raxworthy described ponds rich in newts near St. Albans. Proper recording is as essential as observation: indeed the latter is virtually useless without the former.

(b) *Management.* Your Committee undertook 20 clearance tasks, arranged by Jon Webster, on dry heathland sites in 1983. The work included clearance of pines, birch and gorse to expose heather banks where rare herps exist or are later to be released. This is tough work, especially in wet weather, but good comradeship prevails and there are chances for discussion. 6 sites are in Surrey, 2 in Hants and 3 in Dorset. Attendances were between 10 and 21.

Pine and bracken are probably the greatest "natural" threats to heather on dry heaths. It is Committee policy to spray bracken with "Asulox" for control. In August 1983, 6 Committee members, helped by 4 volunteers, sprayed this plant on 10 sites in Surrey and Hants, whilst 4 members, with 2 volunteers, carried out similar work on 4 Dorset sites. Full reports were received from Howard Inns. On behalf of BHS I thank, in addition to the Committee members named below, the following for their part in the above conservation actions: A. Bailey, C. Beckett, C. and G. Buckley, J. Davidge, S. Dennison, B. and P. Douthwaite, M. and N. Dolton, G. Gardiner, P. Gumbrell, M. Hodges, I. Hornby, L. Inns, K. Kapusi, M. Langford, C. Packham, R. Paxton, R. Turpin and M. Winder.

In August, also, Keith Corbett and Bill Whitaker did pond clearances in the SE London area: other Committee members assisted, but more help is needed in future for this valuable work.

On several occasions in 1983, Jon and Keith used generous grants to them from WWF to pay for Conservation Volunteers to clear heathland and pond sites. On behalf of BHS, I thank WWF for this much-needed and greatly appreciated help which we owe largely to Chris Tydeman, a good friend of the Society.

(c) *Other Activities.* 4 Committee meetings were held, 2 each at the Zoo offices and at Shoreham. Attendance was excellent. In 1983 S. Bolwell and M. Lambert left the Committee and G. Laverick, J. Newton and W. Whitaker were elected to it. Committee members represented BHS on Link and at Link-NCC meetings. As well as the Southport meeting mentioned above, the Committee was represented at conservation meetings concerning sites controlled by MoD and local authorities in Surrey and Hants. A separate meeting with NCC at Slepe Farm, Wareham, Dorset is an annual event having important implications for BHS involvement and in rare reptile sites in this vital county. Site meetings were held with Forestry Commission staff and private owners, leading to new BHS management plans. On October 11th, Council appointed Tom Langton as BHS honorary Conservation Officer and agreed his terms of reference. Tom obtained funds from the Vincent Charitable Trust for an office at the Institute of Biology for 1984 and moved to this in December 1983. Keith Corbett continued able to put the case for herps in BBC programmes and, like Mark Jones, in local newspapers: such publicity is of great value to BHS. Committee members gave talks and lectures and dealt with many requests by letter and telephone for advice and help.

Finance. Your Committee asked for and received minimal support from BHS central funds. I realise that many members will expect part of their subscriptions to be directly used for conservation and when its financial affairs permit Council will no doubt allocate more money to its Committees. At the Committee's instigation, BHS affiliated to the British Trust for Conservation Volunteers in September 1983 and all members can be insured for fieldwork at a per capita rate, payable annually. From August 1983 a travel grant from NCC enabled us to refund members for conservation work at the rate of 6.6p/mile, enough to cover most petrol: we are duly grateful to NCC's Grants Officer, Mr. E.C. Hammond. We also thank the WWF and the NCC for a grant of £383 for a new chain-saw.

In summary, your Committee can report that it has played a constructive and active part in trying to preserve and even increase the U.K. examples of the animals of which we are all so fond.

BHS Conservation Committee (May 1984)
H. Arnold, B. Banks, M. Beebee, T.J.C. Beebee, A. Braithwaite, J. Buckley, K. Corbett, D. Dolton, M. Dolton, J. Gaughan, R. Griffiths, E. Haslewood, G.A.D. Haslewood, H. Inns, M. Jones, T. Langton, G. Laverick, J.R. Newton, M. Preston, C. Raxworthy, E. Wade, J. Webster, W.J. Whitaker.

Advisers
E. Arnold (British Museum (Natural History)), A. Cooke (NCC), J. Griffin (Xenopus Ltd.), J.C.F. Sims (ASRA), R. Stebbings (Institute of Terrestrial Ecology), C. Tydeman (WWF), J. White (NCC), D. Yalden (Manchester University).

G.A.D. Haslewood

B.H.S. PUBLICATIONS LIST — JANUARY 1984

1) *British Journal of Herpetology* — Back issues £3 per copy. Current issues received free by members.

2) *B.H.S. Bulletin* — Back issues £1 per copy. Current issues received free by ordinary members and Junior members.

3) *Junior Section Newsletter* — £2 for one years subscription (3 issues) received free by Junior members.

4) *Information sheets* on the basic care of reptiles and amphibians in captivity produced by members of the Captive Breeding Committee. Subjects at present covered are: Tortoises, Terrapins, Yellow & Fire Bellied Toads (Bombina sp.), Clawed Frogs (Xenopus sp), Salamanders (mainly Salamandra s.), Treefrogs (Hyla cinerea and arborea), European lizards (mainly Lacerta sp), Iguanas, Garter snakes (Thamnophis sp), Pythons & Boas, Rat & King snakes (N. American Elaphe & Lampropeltis), Venomous Reptiles and the Dangerous Wild Animals Act (deals with legal aspects only and not care), Painted frogs (Discoglossus pictus), Axolotls (Ambystoma mexicanum).

5) *The Care & Breeding of Captive Reptiles* (0000) £3 to members, £5 to non members.

6) *Conserving Sea Turtles* (1983) by N. Mrosovsky. UK £5, USA $10.

7) *Establishing & Maintaining Crested Newts in Garden Ponds* (0000) free leaflet.

8) *Being Kind to Snakes* (0000) a free leaflet.

9) *Britain's Amphibians & Reptiles are in Decline* (0000) a free leaflet.

10) *Garden Ponds as Amphibian Sanctuaries* (0000) a free leaflet.

11) *Wildlife & the Law No. 2 Reptiles & Amphibians* (1982) a free leaflet published in conjunction with CoEnCo.

12) *A Guide for the Identification of British Amphibians & Reptiles* (0000) 50p.

How to order: Items 1 & 2 — details are available from the BHS Librarian who is: Mr. J. Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW.

Item 3 — available from the Administrative Secretary on the BHS Education Committee who is: Miss J. Pracy, 27 Clifton Gardens, Enfield, EN2 7PL.

Items 4, 5, 6 & 7 are obtainable from the Chairman of the BHS Captive Breeding Committee who is: Dr. S. Townson, 10 Wadley Road, London E11 1JF. For items 4 & 7 please send a large SAE. For item 5 please send 50p postage. For item 6 75p postage (surface) or £2.80 air mail to UK. To USA $1 postage surface mail or $5 air mail.

Items 8, 9 & 10 are obtainable from the Chairman of the BHS Conservation Committee who is: Professor G. Haslewood, 28 Old Fort Road, Shoreham-by-Sea, Sussex. Please send a large SAE.

Item 11 — can be obtained from the BHS Education Officer who is: Vic Taylor, 80 Curzon Avenue, Enfield EN3 4UE.

Item 12 — is available from the author of the booklet who is: John Buckley, 77 Janson Road, Shirley, Southampton SO1 5GL. The cost includes post and packing.

Payment: International money orders and cheques made payable to "British Herpetological Society".

NORTH EAST ENGLAND B.H.S. REGIONAL GROUP

A local B.H.S. group is to be established in the north east of England in September this year. Meetings are to be held in Durham. It is hoped that when other regional groups are established, this group will cater for members living in Northumberland, Tyne & Wear, Durham, Cleveland, and North Yorkshire, however any B.H.S. member is welcome to attend meetings.

A steering committee has been set up to organise meetings, until the first A.G.M. is held. The main aim of the group in 1984 must be to increase membership of the society in the counties mentioned above. Membership in the region currently stands at 18! Therefore to ensure that sufficient people attend talks, joint meetings are to be held with Durham County Conservation Trust this year. If any B.H.S. members know non-members living in the region who are interested in herpetology please invite them to attend our meetings.

At present it is hoped to have four meetings a year, until membership increases. The group would be interested in hearing from any members who would be willing to give a talk to the group in 1985 and 1986. Any volunteers should contact B. Banks, c/o 3 Highside Drive, Humberland Hill, Sunderland, Tyne & Wear.

Meetings for 1984
All meetings will start at 7.00 pm, and are to be held in the Adult Education Centre, 32 Old Elvet, Durham.

SEPTEMBER 7th	Mr. T. Langton (BHS Conservation Officer). The conservation of Britain's amphibians and reptiles.
DECEMBER 14th	Mr. G. Laverick (Royal Holloway College, London University). A herpetological expedition to Madagascar, to be followed by the groups first A.G.M.

B. Banks

SUFFOLK REPTILE AND AMPHIBIAN SURVEY

I am currently conducting a survey of reptiles and amphibians in Suffolk, the results of which will be published in the form of a Provisional Atlas in 1985. Records are needed from all over the county, but particularly from the central and western areas, where observer coverage has so far been sparse. The information needed to qualify each record is as follows:

1. Name of species
2. The date, or at least the season of the year, when the sighting was made.
3. The name of the locality where the sighting was made. (A four or six figure grid reference number would be very useful).
4. Any additional details, e.g. numbers observed; whether the site is used for breeding; details of habitat, etc.
5. The name and address of the observer.

Information concerning dead specimens (such as road casualties), amphibian spawn or larvae, and snakes' sloughs is similarly welcome. I am also interested in older records, particularly those made since 1970. All information will be treated confidentially.

Records can be sent to me at THE SUFFOLK BIOLOGICAL RECORDS CENTRE, THE MUSEUM, HIGH STREET, IPSWICH.

Mark Jones, (County Recorder for Reptiles and Amphibians)

1984 AMPHIBIAN ECOLOGY SEMINAR

Annual amphibian ecology seminars are now held to review research work currently being carried out in Britain. Although the talks are given by research scientists, space is available for attendance by anyone (professional or otherwise) interested in new discoveries about our native species. The 1984 Seminar will be held at the Field Centre of the University of Sussex (situated in the Ashdown Forest) over the weekend of November 24/25th. Space is not unlimited; anyone interested in coming along should contact: Dr T. Beebee, School of Biology, University of Sussex, Falmer, Brighton, BN1 9QG, **before the end of September,** for further details.

DONATION OF REPRINTS FROM PROFESSOR ROGER CONANT

The Society would like to express its gratitude to Prof. Conant for his kind donation of a collection of his own reprints to the BHS Library.

DUTCH SNAKE SOCIETY

A relatively new society with a lively, informative journal, published bi-monthly (there is an English edition). Covers all aspects of interest in snakes — care and breeding, natural history, etc., advertisements for members. Annual international meeting. Details from the Secretary, Jaap Kooij, Langervelderweg 137, 2211 AG Noordwijkerhout, The Netherlands.

EUROPEAN HERPETOLOGICAL MEETING, PRAGUE, 1985

(August 19-23)

Joint meeting of Societas Europeae Herpetologica with herpetologists from Czechoslovakia, Bulgaria, German Democratic Republic, Hungary, Poland, Romania and USSR.

PURPOSE — The aim of this meeting is to give scientific herpetologists from all parts of Europe and from overseas an opportunity to exchange their views, as well as for personal contacts, both resulting in deepening of scientific intercourse and co-operation in the study of amphibians and reptiles.

PROGRAMME — The meeting programme will consist of platform sessions where oral contributions will be given, poster exhibitions, general meeting of SEH, social gatherings, and one-day field trip. Special guest programme for family members may be arranged by travel agency CEDOK.

TOPICS — Contributions on palaeontology, evolution, phylogeny, systematics, ecology, physiology, embryology, morphology, etc. of amphibians and reptiles are welcome. Besides a special mini-symposium will be organised, focusing on current questions concerning the influence of ice age on European herpetofauna.

LANGUAGE — To avoid communication difficulties, all contributions should be presented in English.

TECHNICAL EQUIPMENT —Two parallel diaprojectors will be available for oral presentations. Posters up to 1 x 1.5 m can easily be exposed.

PUBLICATION — All contributions to the Meeting will be published in the form of a book, including a list of the participants, addresses of the contributors, and an index of the major subjects. Posters and oral contributions will be treated equally in the book.

ACCOMMODATION — To avoid high prices of accommodation in hotels, accommodation in the college of Charles University is proposed instead. The organisers of the Meeting unfortunately are not able to pay accommodation expenses. The prices, for one day, are as follows: single occupancy 127 Kcs/approx. DM 28, double occupancy 218 Kcs/aprox. DM 48. All usual facilities, shower etc., are available.

REGISTRATION FEE — Printing abstracts, mailing expenses, etc. force the organiser to impose a fee of 250 Kcs on the participants.

The Faculty of Natural Sciences, Charles University, Prague, will be the host of the European Herpetological Meeting. A detailed programme and Call for Papers will be delivered during Spetmber 1984 only to those who return the Preliminary Application Form or write to Dr. Zbynek Rocek, Department of Paleontology, Charles University, Albertov 6, 128 43 Praha 2, Czechoslovakia, before the end of August 1984.

HERPETOLOGICAL ACTIVITY IN BRITAIN : UNIVERSITIES 2

This is the second of a series of articles on herpetological work in Britain. The first series of articles from University departments appeared in *BHS Bulletin* No. 7: 29-42 (June 1983). As before, references given either follow the format laid down by *British Journal of Herpetology* or abbreviated to that in the *World List of Scientific Periodicals* (4th edition).

M.R.K.L.

WORK ON LIZARDS IN THE SCHOOL OF ANIMAL BIOLOGY, U.C.N.W., BANGOR (28.6.83)

Dr. I.B. WILSON

School of Animal Biology, University College of North Wales, Bangor, Gwynedd LL57 2UW

Since 1974 we have been working with the live-bearing skink, *Chalcides ocellatus* Forsk., mainly on aspects of reproductive biology. This is a very common species, wide-spread in most of the countries bordering the south and south-east Mediterranean and rather more sparsely scattered around the north-east fringe. We obtain stock from Cairo. Our animals have reached a maximum length of 21cm with a weight of 25-30gm. There is little sex-dimorphism; with experience the males can be distinguished, but not reliably, as generally their heads are wider across the angle of the jaws. Cloacal probing for the small hemipenes is confounded by the presence of a pouch in the same region of the female.

The animals breed well under entirely artificial conditions: they are easily fed (cat food is the staple diet) and maintained and new-born females can reach breeding size (c.17gm) in one year. We have made detailed studies of reproductive cycles in male and female, including the cytology of oogenesis and spermatogenesis and steroid hormone assays. The wild animals in Egypt are said to have a breeding season restricted to late spring and early summer. Although we still find a peak of activity in this period in animals which have been under constant laboratory conditions for one to two years, there is sporadic breeding through most of the year.

At copulation the biting grasp of the male leaves an obvious scar on the side of the neck, which remains visible for several weeks. (Unfortunately, in our colony males sometimes copulate with males so these scars are not invariably a sign of a recently inseminated female). The females' willingness to copulate is, again unfortunately, not immediately or even directly associated with actual ovulation, so intervals from observed copulation to birth of the young vary from 58-95

days. We have not been able to determine the actual length of the true gestation period but we do not think it can vary so much between females under identical conditions. Presumably the females can store sperm but we do not know how long it may remain viable nor have we been able to identify any special storage facility in the tract. Litter size, which ranges from 2-10 (average 4.4), is not related to the length of the post-copulatory "pregnancy" period.

Labelled amino-acids, injected into the mother, are transferred to the various compartments of embryos developing in the uterus. Together with calculations based on dry-weight gains of the developing eggs through gestation, this shows that there is quite extensive exchange of potential metabolites. Through embryogenesis the form of excretory nitrogen changes. The yolk sac is an important site for the handling of ammonia and urea in the early stages but this function declines when the embryos reach a length (overall) of about 3.0cm. The allantois does not replace this function, except transiently, because allantoic levels also decline when an embryonic length of 5.0cm is reached. This is, in fact, shortly after the chorio-allantoic placenta is fully formed. Furthermore, measurements of urea in maternal blood show that levels through the early stages of pregnancy are the same as in the non-pregnant animal but, with embryos of 4.5cm length and fully established placentae, up to full term, the maternal blood urea values are double the non-pregnant level. We have no direct evidence, from culturing embryos in vitro, that *C. ocellatus* has a truly dependent viviparity. Certainly, the embryos develop a structurally sophisticated placentation. Light and electron microscope studies have shown a yolk-sac placenta of typical lacertilian type and a complex chorio-allantoic placenta. The latter has an outer ring-like area of intimate attachment to the highly vascularised uterine epithelium, surrounding a central, much-folded area. A similar structure has previously been described, but at the light microscope level only, for two *Lygosoma* species.

Functional corpora lutea persist for at least 2/3 of the "gestation" period and their development is directly related to plasma progesterone levels, which build up to a peak (about 12 times their value at the start of oogenesis) at mid-term and then decline to parturition. Plasma oestrogen levels rise during oogenesis to reach a peak (about 10 times their starting level) when follicles reach the mature pre-ovulatory size (c.9.0mm). Oestrogen levels during early pregnancy are comparable with those of early oogenesis but decline by about 50% by the time of parturition.

A detailed study of the male under constant laboratory conditions (our standard of 14h. day with temp. of 31°C and night at c.20°C) has shown a cyclic pattern of recrudescence (lasting c.2 months), sperm production (5-6 months) and quiescence (4-5 months). There are, of course, related rises and falls in serum androgen levels. The period of recrudescence is shorter than reported for animals in the wild whilst the period of sexual potency is comparatively lengthened. It seems, as with the females, that in the absence of natural factors the timing of the cycle may drift from the natural peak. Individuals can become active in more or less any month but the majority retain a timing similar to the wild stock. The pattern and length of the cycle appear to follow an endogenous rhythm, i.e. once recrudescence starts quiescence must follow about 8 months later. However, we have yet to establish whether or not there is a refractory period or whether the inherent cycle persists after more than 2 years under constant conditions.

We have good evidence that, in both male and female, the major environmental requirement for sexual recrudescence is warmth. At 15°C neither sex showed any gonadal activity on long (14h.) or short (10h.) days and androgen levels in males were, if anything, lower than in the "normal" quiescent state. At 31°C animals became active irrespective of daylength (peak androgen levels were reached in sperm-producing males with some minor difference in levels related to daylength). Under our standard conditions there was no clear relationship between fat-bodies and gonadal cycles, only in pregnant females was there a significant decline in the fat-bodies.

We have made a detailed light and electron microscope study of the embryonic development and mature structure of the parietal eye and its associated pineal organ (together = 'pineal complex') and we have run some experiments on their possible function. The eye has a well differentiated structure with cornea (a thick transparent layer including the interparietal scale), a simple lens and a retina complete with photosensory and ganglion cells and a nerve tract to the left habenular ganglion. The pineal organ is a hollow, lobulated structure (immediately posterior to the parietal eye) with a solid stalk connecting it to the brain near the habenular ganglia. It has no typical photoreceptor cells but, instead, so called 'secretory rudimentary photoreceptor cells',

such as previously described by Collin for some *Lacerta* species. There is a large nerve to the pineal organ but we have not managed to identify any synapses with, or terminals in, the 'sensory' innter epithelial layer. There is a very well developed vascular supply to the pineal complex. Part of this could be involved in selective filtering of any light passing through or as a heat-sink in some thermoregulatory role. Attempts to shield the parietal eye (with various paints or masks) did not produce much significant change in activity of the lizards. We have recorded basking behaviour (under a tungsten lamp!) in particular. In the 'normal' colony there is a major peak of basking about 2-3 hours after 'dawn' (hot lamp comes on 1h. after dawn) and two smaller peaks about 4h. then 8h. after that. With parietal eye shielding, the first major peak remains the same but basking is rather more scattered through the later day. Surgical removal of the parietal eye has produced no quantifable effect upon, for instance, spermatogenesis (but this was in animals already in recrudescence, clearly not the only, or best, test of pineal involvement in reproduction).

Currently we are looking at pituitary/thyroid structure and interactions, especially in relation to reproductive activity in the male. Work continues on thermoregulatory behaviour (including continuous temperature recording from an implanted thermistor) and on heat and cold tolerance. The endocrine profile of individual females is being monitored (with monthly blood sampling by cardiac puncture) from preovulatory stages through pregnancy.

Students associated with these studies:
M.M. Ibrahim; G.Y.Z. Dehlawi; F.M.S. Mahmoud; Z.N. Mahmoud; Elizabeth Pulford; I. Abdulghani.

WALES, MENAI BRIDGE (Marine Science Laboratories, Animal Biology Group, University College of North Wales, Menai Bridge, Gwynedd LL59 5EH)

Dr. John Davenport: Turtle research at Menai Bridge, North Wales

We first started working on *Chelonia mydas* about 5 years ago when a student from Cyprus came to take our 1 year M.Sc. Marine Biology course. She carried out an appetite and nutritional study on a dozen yearling animals supplied by the Fisheries Department at Nicosia who are carrying out a conservation/head start programme on the species. It seemed a shame to return the animals immediately to Cyprus, and they were kept for a further year during which they grew to about 3kg each and were investigated by a final year undergraduate student under my supervision. She measured oxygen consumption and specific dynamic action in the animals and also measured heart rates under a variety of conditions (including diving). The turtles were then returned to be reincorporated into the Cyprus headstart programme. Papers appeared in *J. Zool. Lond.* and *Aquaculture.*

In 1981 a second batch of *Chelonia,* this time six hatchinglings, were imported. More nutritional work was done including a study of rate of food transport through the gut (a report will appear in a coming issue of the *British Journal of Herpetology*) during the first year of their stay with us. Subsequently they have been used (together with specimens of *Mauremys caspica, Kinosternon subrubrum* and *Chrysemys* (= *Pseudemys*) *scripta*) in a comparison of swimming in fresh water and marine turtles (including a new model of locomotion in marine turtles) which will be described in a paper appearing in the *Proceedings of the Royal Society* in February 1984.

Bringing you right up to date, a batch of young loggerheads *(Caretta caretta)* will be arriving shortly!

LONDON, WESTFIELD COLLEGE (Department of Zoology, Westfield College, University of London, Hampstead, London NW3 7ST — to merge with Queen Mary College in October 1984).

Dr. R.C. Tinsley: Research is directed towards a range of aspects of the ecology, parasitology and evolution of amphibians. The main theme during the past 15 years has concerned the African *Xenopus* species and fieldwork has been carried out in Uganda, Kenya, Ethiopia, Rwanda, Zaire,

South Africa, Sierre Leone and Ghana. Laboratory stocks include over 1000 individuals of 10 of the known species and subspecies of *Xenopus* together with representatives of *Hymenochirus* and *Pipa*. Currently a major project involves the N. American *Scaphiopus* with fieldwork in Arizona for the past 3 years and lab. stocks of around 400 specimens of 3 southwestern species. Other parasitological work is based on terrapins and several N. American and African species are maintained in the lab. for studies on infection.

The work on *Xenopus* falls into a number of categories which are illustrated by the following selected references:

i) *Ecological and evolutionary relationships of Xenopus species*

Tinsley, R.C. (1973). 'Studies on the ecology and systematics of a new species of clawed toad, the genus *Xenopus*, from Western Uganda.' *J. Zool., Lond.* **169**, 1-27.

Tinsley, R.C. (1975). 'The morphology and distribution of *Xenopus vestitus* (Anura: Pipidae) in Central Africa. *J. Zool. Lond.*, **175**, 473-492.

Tymowska, J., Fischberg, M. and Tinsley, R.C. (1977). 'The karyotype of the tetraploid species *Xenopus vestitus* Laurent (Anura: Pipidae). *Cytogenet. Cell Genet.*, **19**, 344-354.

Tinsley, R.C., Kobel, H.R. and Fischberg, M. (1979). 'The biology and systematics of a new species of *Xenopus* (Anura: Pipidae) from the highlands of Central Africa.' *J. Zool. Lond.*, **188**, 69-102.

Kobel, H.R., Du Pasquier, L. and Tinsley, R.C. (1981). 'Natural hybridisation and gene introgression between *Xenopus gilli* and *Xenopus laevis laevis* (Anura: Pipidae).' *J. Zool. Lond.*, **194**, 317-322.

Tinsley, R.C. (1981). 'Interactions between *Xenopus* species (Anura: Pipidae).' *Monitore zool. ital. (N.S.) Suppl.* **15** (9): 133-150.

ii) *The parasite fauna of Xenopus, and host-parasite evolution*

Fain, A., Baker, R.A. and Tinsley, R.C. (1970). 'Notes on a mite *Xenopacarus africanus* n.g., n.sp., parasitic in the nasal cavities of the African clawed frog *Xenopus laevis* (Ereynetidae: Trombidiformes)'. *Rev. Zool. Bot. Afr.*, **80**, (3-4), 340-344.

Tinsley, R.C. and Sweeting, R.A. (1974). 'Studies on the biology and taxonomy of *Diplostomulum (Tylodelphylus) xenopodis* from the clawed toad, *Xenopus laevis*. *J. Helminthology*, **48**, 247-263.

Fain, A. and Tinsley, R.C. (1975). '*Xenopacarus kenyensis* n. sp. from the nasal cavities of *Xenopus borealis* (Parker).' *Rev. Zool. Afr.*, **89**, 854-858.

Van der Lande, V.M. and Tinsley, R.C. (1976). 'Studies on the anatomy, life history and behaviour of *Marsupiobdella africana* (Hirudinea: Glossiphonidae).' *J. Zool., Lond.* **180**, 537-563.

Tinsley, R.C. and Wynne Owen, R. (1979). 'The morphology and biology of *Xenopodistomum xenopodis* from the gall bladder of the African clawed toad, *Xenopus laevis*.' *J. Helminthology*, **53**, 307-316.

Tinsley, R.C. and Whitear, M. (1980). 'The surface fauna of *Xenopus* skin'. *Proc. Roy. Soc. Edinb.* **79B**, 127-129.

Tinsley, R.C. (1981). 'The evidence from parasite relationships for the evolutionary status of *Xenopus* (Anura: Pipidae).' *Monitore zool. ital. (N.S.) Suppl.* **15** (19): 367-385.

Tinsley, R.C. (1982). Relationships between host genotype and parasite specificity. *Parasitology*, **84**, (1): iii-iv.

iii) Parasite studies have also been based more specifically on one group of monogenean helminths — *polystomatid infections in amphibians and reptiles.*

Tinsley, R.C. (1973). 'Observations on Polystomatidae (Monogenoidea) from East Africa with a description of *Polystoma makereri* n. sp.' *Z. ParasitenK.* **42,** 251-263.

Tinsley, R.C. (1974). 'A redescription of *Polystoma pricei* Vercammen-Grandjean, 1960 (Monogenoidea: Polystomatidae).' *Rev. Zool. Bot. Afr.* **88** (1), 165-174.

Tinsley, R.C. (1974). 'Observations on *Polystoma africanum* Szidat with a review of the inter-relationships of *Polystoma* species in Africa.' *J. nat. Hist.* **8,** 355-367.

Tinsley, R.C. (1978). 'The morphology and distribution of *Eupolystoma* species (Monogenoidea) in Africa, and a description of *E. anterorchis* sp. n. from *Bufo pardalis* at the Cape.' *J. Helminthology,* **52,** 291-302.

iv) and particular interest in this area concerns *the reproductive biology and transmission of polystomatid parasites in amphibians.*

Tinsley, R.C. and Wynne Owen, R. (1975). 'Studies on the biology of *Protopolystoma xenopodis* (Monogenoidea): the oncomiracidium and life cycle.' *Parasitology,* **71,** (3), 445-463.

Tinsley, R.C. (1978). 'Oviposition, hatching and the oncomiracidium of *Eupolystoma anterorchis* (Monogenoidea).' *Parasitology,* **77,** 121-132.

Tinsley, R.C. (1980). 'Factors influencing reproduction in *Protopolystoma xenopodis.*' *Proc. 3rd Eur. Multicoll. Parasitol.* **130.**

In the past three years the main field and laboratory studies have been directed at the adaptations for transmission by parasites of the desert-adapted *Scaphiopus* species in Arizona. In these hosts, the very brief period of surface activity of the toads restricts polystomatid transmission to a period shorter than for any other helminth. Parasite reproduction biology provides a dramatic contrast to that studied in *Xenopus* where the aquatic host is continuously exposed to parasite invasion.

Preliminary accounts of the *Scaphiopus* investigations are published in

Tinsley, R.C. (1982). *Pseudodiplorchis americanus* (Monogenea); Synchronisation of transmission with restricted host availability. Proc. 5th International Congress of Parasitology. In: *Molecular and Biochemical Parasitology Suppl.* **459.**

Tinsley, R.C. (1982). The reproducive strategy of a polystomatid monogenean in a desert environment. *Parasitology,* **85,** xv.

Tinsley, R.C. & Earle, C.M. (1983). Invasion of vertebrate lungs by the monogeneans *Pseudodiplorchis americanus* and *Neodiplorchis scaphiopodis. Parasitology* **86,** 501-517.

and a review describing parasite reproductive biology in the context of host ecology is included in

Tinsley, R.C. (1983). Ovoviviparity in platyhelminth life cycles. *Parasitology,* **86,** 161-196.

A more comprehensive list of papers will be found in the bibliographies of those listed above.

Current research by Miss Helen Jackson is concerned particularly with the productive biology of parasites infecting *Xenopus,* including parasite egg production, viability, and the influence of a range of environmental factors — temperature, host starvation, anaemia — on reproductive rate. Ecological studies on parasite transmission have involved fieldwork in Texas, Arizona and California.

Jackson, H.C. (1982). *Protopolystoma xenopodis:* success of reproduction in single and multiple worm infestations. *Parasitology,* **85,** (2) v.

Jackson, H.C. (1983). The effects of host starvation on egg production by a blood-feeding monogenean. *Parasitology*, **87**, (2) xv.

Current research by Mr Mark Simmonds is based on ecological interactions between *Xenopus* species and has included interspecific differences in distribution, diet, environmental and physiological tolerance, activity rhythms and morphological adaptation. Fieldwork on *Xenopus* ecology has been carried out in Kenya (1982) and South Africa (1983) (through the award of a Churchill Fellowship), and field studies have also concerned the feral populations of *Xenopus* in Britain.

Simmonds, M.P. (1982/83). The amphibian invader. *World Wildlife News*. 6-7.

Other works in progress in this Department includes studies on as yet undescribed species of *Xenopus*, the breeding of the endangered species *Xenopus gilli* (from the Cape), and the ecological relationships of polyploid *Xenopus* (from Central Africa).

The following article has been reprinted from New Scientist 26 April 1984

SNAKES ALIVE!

Romulus Whitaker reports on India's latest money-spinner

The Irulas are a tribe numbering about 100,000 which lives in the northern coastal districts of Tamil Nadu, South India. Several thousand Irula men are snake hunters *par excellence*. It is no coincidence that Madras — the city that evolved in the earlier thorn-forested domain of the Irulas — became the centre of a once thriving snakeskin export industry (10 million skins in 1966-67 alone).

Concern for wildlife conservation led the Indian government to ban the export of snakeskins in 1976. This meant a considerable loss of revenue and employment for thousands of snake hunters. However, the uncontrolled slaughter of millions of rodent-eating snakes each year was aggravating a major problem: in India rats caused immense damage to field crops and stored grain. If only the snakeskin industry were to be controlled — and the snakes "farmed" with due consideration to the dynamics of the snake and rat populations — all this could be labelled as a rational use of a wildlife resource. Some would claim that it presented good tribal employment. But this was far from happening.

Snake venom is in demand to produce antivenoms at three of India's main laboratories. Venom collected at the snake farms might just provide the income that the Irulas need.

The land-starved, wretchedly under-priveleged Irulas are now embarking on what could be their salvation: catching snakes for venom. The Irula Snake Catchers Co-Operative Society was recently registered in Madras and the government gave the co-operative permission to catch its first batch of 5000 snakes: kraits, cobras, Russell's vipers and saw-scaled vipers. The co-operative keeps the snakes for three to four weeks, and extracts venom four times during that period. It then releases the snakes to the wild with their belly scales code-slipped to provide reference should they become recaptured. The present techniques preclude the trauma caused by the creatures being kept in captivity for long periods, and by the overuse of the not-too-gentle procedures used in extracting venom. This approach satisfies the conservation objectives of the co-operative, and allows employment of a maximum number of catchers.

Once venom sales are profitable the Irula co-operative intends to expand into crocodile farming, deer ranching and pest control. The Madras Snake Park Trust will house the snakes and execute the venom extraction procedure. A natural spin-off will be the many interested visitors who will pay to watch this dangerous routine.

Romulus Whitaker writes from the
Madras Snake Park, Raj Bhaven PO Madras 600 022, India

The following article has been reprinted from ASRA Journal (1983) with kind permission of the Editor

POSSIBLE BENEFITS OF COMMERCIAL RANCHING OF REPTILES AND AMPHIBIANS TO CONSERVATION OF SPECIES AND THEIR HABITAT

JOHN GRIFFIN

Xenopus Ltd., Redhill, Surrey

ABSTRACT

The ideas put forward are suggestions, the likely degree of success of the ideas being open to opinion. Various methods of commercially ranching reptiles and amphibians are discussed and examples of 'accidental' ranching are described. It is suggested that forms of commercial ranching can not only satisfy the demand for animals for various purposes but also secure a visible and healthy natural population.

Virtually all existing and proposed legislation ignores the principal reasons for decline of reptile and amphibian populations i.e. habitat destruction of one kind or another. Invariably legislation concentrates on the trade which would have negligible impact on the vast majority of species if proper measures were taken to protect habitat.

Even where habitat is conserved management tends to be directed towards birds, mammals and plants because reptiles and amphibians have less of a following and therefore are politically unimportant, i.e. business or state interests will usually win any battle with herpetologists over land use, and it is most unlikely that any government will supply sufficient funds to prevent a reptile or amphibian from becoming nationally extinct, let alone rare.

Current and potential legislation makes it highly likely that the keeping of wild reptiles and amphibians in captivity for all but exceptional purposes will be a thing of the past within the next ten years, as will the collection of wild specimens for their skin or other products. Most people would accept that ethically this is no bad thing even though in most cases the benefits to the conservation of the species will be negligible. The likely reaction of companies with a commercial interest in reptiles and amphibians and their products will be either to stop trading in them or in some cases start intensively breeding the most commercially significant species either in the laboratory or by farming. Here again there is no benefit to conservation.

As may be expected many of the remaining areas where reptiles and amphibians are reasonably secure are those which are only marginally suitable for agriculture, forestry or other commercial purposes. However, they will only remain untouched until new agricultural processes or commercial needs made these marginal areas commercially viable.

If some of this currently unproductive and marginally productive land were managed in such a way as to produce a surplus of the reptiles and/or amphibians natural to that area these specimens could be 'harvested' each year and sold to yield a return on this land.

This would not only serve to conserve the species in its natural habitat without relying on state or charitable funds, but would also provide a potential reserve for restocking the species where this may be necessary. Being a commercial project it makes other potential uses for the land less attractive and should farming development take place it is more likely that such development will be carried out in a way that is not harmful to the species in question.

For the purpose of this proposal my definition of a surplus is that number of animals that if left to their own devices would either die due to overcrowding or would migrate to other suitable, but under-populated habitats.

Although this proposal is largely based on theory there are strong reasons to believe that it could work. Some examples are as follows:

In August 1979 I had a pond of approximately 300 square metres dug at one corner of our property. This is in an area of mixed farming, the land immediately adjacent being used mainly as dairy pasture. There are relatively few ponds in the immediate area. This pond was planted with a wide range of water plants, but no fish were introduced. In the spring of 1980 approximately twenty specimens of *Triturus cristatus* were released and a few clumps of the spawn of *Rana temporaria* were put in. The process was repeated in 1981 and approximately fifty *Rana temporaria* from the surrounding fields also used the pond for spawning.

By early September this year young *Triturus cristatus* were present in hundreds, possibly thousands. Similarly, *Rana temporaria* of between 2 cm and 3 cm long are present in the area in thousands. It is predicted that this pond will become overpopulated in the sense that migration to other marginal habitats will occur by the summer of 1983.

I have discussed with local farmers the possibility of their creating ponds suitable for these species in parts of woods and fields that are too wet to be agriculturally more than marginally viable. The response is encouraging, but in each case the farmers expect a financial return. My opinion is that if *Rana temporaria* and *Triturus cristatus* were commercially collected from these ponds designed primarily for the purpose of breeding these species we could supply the bulk of the UK requirement and have created a healthy and abundant wild population.

A supplier of ours in the United States purchased several acres of woodland and dug a series of ponds of varying sizes and depths during 1978. He is now able to collect such species as *Acris crepitans, Notophthalmus viridiscens, Ambystoma maculatum* and several somewhat obscure salamanders from his own ponds, and has been so encouraged by the commercial success of the venture that he is continuing to buy more land and managing the habitats to the benefit of the amphibian population.

I understand that the *Hyla arborea* and *Bufo viridis* that we receive from Turkey come from a small area where the local farmers do no more than ensure that the breeding ponds do not dry out before the tadpoles of the species have metamorphosed. This has resulted in the population of these amphibians increasing to the point where the farmers can collect substantial numbers each spring and so increase significantly their income. The legislation proposed under the Berne Convention may well stop this trade, in which case no doubt the farmers will cease this pond management with a resultant decline in population.

Very large scale applications of the ranching principle may have considerable social and economic importance in some third world countries. For example, large scale collection of frogs for export as frogs legs is causing a decline in the frog population in rice fields in India. This is resulting in an increase in insect pests which in turn has led India to start importing pesticides to a greater value than the frog legs exported. This economically ludicrous situation could easily be overcome by very low cost management of the population to increase the number of frogs to a level where they once again control the pests and still provide enough for export.

Similarly very simple, low cost management of frog populations could increase the numbers available as high protein food in those areas of Africa and South America where local populations rely heavily on frogs as a basis of their diet.

The above examples relate only to amphibia, however I have little doubt that habitat management could produce commercially significant quantities of many reptile species. I feel that the type of project described could do a great deal to make these animals more abundant in some areas and ensure that no species becomes extinct due to excessive agricultural pressures on marginal land. The views and better still, practical experience of other herpetologists and, if possible, agriculturalists and economists, will be of great interest, and may I hope lead to positive, self-financing conservation.

SUCCESSES AND FAILURES OF AMPHIBIANS IN GARDEN PONDS

TREVOR BEEBEE

434 Falmer Road, Woodingdean, Brighton, Sussex

INTRODUCTION

The value of garden pond habitats to amphibians in Britain has been increasingly appreciated in recent years, and surveys have revealed their widespread colonisation by *Rana temporaria, Bufo bufo* and *Triturus vulgaris* in places as far apart as Leicester and Brighton (Mathias, 1974-5; Beebee, 1979). *T. helveticus* can also invade garden ponds successfully in districts where it is abundant, but *T. cristatus* seems to do so less frequently unless it is deliberately introduced. During April 1984 I undertook a survey of gardens in the area closest to my home, with the hope of finding out: (1) The extent of use of all ponds within a specific defined area, rather than a random sample survey of the kind I have previously attempted in Brighton; and (2) whether the populations of *T. cristatus* and *T. alpestris* which have been established in my own ponds since 1977 had succeeded in spreading to any of the nearby garden sites.

METHODS

A large scale (1:1250) ordnance map of the part of Woodingdean in question, showing individual garden plots, was obtained during the winter of 1983/84. The 155 houses and bungalows closest to my own home were visited in February to ascertain which ones maintained garden ponds, and to obtain preliminary details from the owners. Those with ponds were then visited again during the first half of April, shortly after dusk, for an inspection lasting 10-20 minutes per pond. Adults and spawn of common frogs and toads, newts and fish were identified using a powerful hand torch. The survey was timed such that, in my own ponds, frog spawn was present but not yet hatched and all 4 species of newts were present in good numbers. It was also known that toad breeding activity in the district was well underway and usually approaching completion.

RESULTS

The basic layout of the suburban area being surveyed is shown in figure 1. Open Downland west of the main road contains no ponds of any kind for kilometre distances in every direction. 18 gardens, excluding my own, were identified as maintaining a total of 22 ponds; 4 gardens each had 2 ponds. Access was obtained to 16 of these gardens (20 ponds). Direct distances of these ponds from my own pools varied from about 60-230 metres, as the newt walks. 10 out of the 22 ponds were separated from mine only by gardens, the remainder by both gardens and minor estate roads.

Data from the ponds, excluding my own, are summarised in table 1. 7 (35%) of them contained no fish, but these constituted a distinct small size class with a mean volume less than one fifth of the average for all ponds and eight times smaller than the 'with fish' group. This size difference was highly significant (Mann-Whitney 'U' = 6, n = 7/13, $p = < 0.005$).

Frogs had spawned in 15 ponds (75% of the total) and showed no discrimination on the basis of size or the presence of fish. The smallest pond encountered in this survey (25 cm square and 10 cm deep) was full of spawn, and the largest (3 x 7 metres, more than 1 metre deep) was also heavily used. Toads were much fussier; only the single large pond mentioned above (which in turn was 6-7 times larger in volume than its nearest rival) was a major breeding site, with many animals and much spawn. Two other ponds just had odd ones or twos, and like my own were apparently used irregularly from year to year. Both of these were also at the 'large' end of the pond size spectrum (with volumes of about 2,700 and 3,000 litres) and all 3 toad ponds contained fish.

Common newts only cropped up in 3 ponds; 2 of these were small with no fish, and the third was the very large toad pond, though in this case newts were seen only in shallow bays almost inaccessible to the huge fish present. No other newt species were seen in any of the ponds examined.

DISCUSSION

The pattern of garden ponds and their use by amphibians in this part of Woodingdean was similar to the 'average' situation in the Brighton area, as determined by an earlier sampling survey (Beebee, 1979). Thus in Woodingdean about 12-13% of gardens had at least one pond (Brighton average = 15%); 35% of ponds were fishless (B.a. = minimum of 25%); 75% had frogs (B.a. = > 50%); 15% had toads (B.a. = 15%); and 15% had common newts (B.a. = 20%). However, this bit of Woodingdean had rather more large (> 2,000 litre) ponds than average for the district (30% cf 15%).

Woodingdean frogs, again like those in Brighton as a whole, made no selection against fishponds as breeding sites despite the fact that tadpole losses in them were often heavy or total (according to pond owners). Nevertheless it was clear that the presence of fish was not necessarily catastrophic and several owners also related observations of froglets leaving their fishponds. Precise shapes of ponds, as well as numbers of fish, were probably the crucial factors influencing tadpole survival. In any case, densities of frogs in the study area were amazingly high; including my own garden sites, I estimated a total production of 200-250 spawn clumps in 16 ponds within a total area of 4 hectares. Assuming at least equality in the sex ratio, there must be about 100 adult frogs per hectare in this section of Woodingdean.

The belief that toads choose larger ponds, preferably those containing fish (which may selectively predate competing tadpoles of other species) was also borne out in the Woodingdean survey. It may be that the 'average-to-good sized' garden pond, of 2,000-3,000 litres, is on the lower edge of the size range usable by toads. Clearly they were doing much less well than frogs, but nevertheless were benefiting from the garden environment.

It looks as if newts suffer more from the presence of fish than anurans do. Although a substantial number of smaller ponds were fishless, this was not as conducive to newts as might intitially be expected. It was not coincidental that the smallest ponds were the fishless ones; a frequent situation was that their owners regularly tried to establish fish, but equally regularly lost them due to extreme summer or winter temperatures. They were not, therefore, by any means a consistently predator-free environment. Only 1 of the 3 ponds with common newts had substantial numbers (tens) of individuals; this pool did not have fish.

The complete absence of palmate, crested and alpine newts was surprising in view of the colonies of all 3 species established in my own garden since 1977. The situation with palmates is perhaps the most easily explained, since this species does not thrive on the chalk Downs and only just about maintains itself (vastly outnumbered by common newts) in my ponds. However, from small introductory stocks in 1977 both crested and alpine newts have built up to substantial populations (many tens) and have bred consistently successfully since 1979/80; yet not even a single individual of either species was seen in neighbouring ponds at a time when my own had been swarming with them for at least 2-4 weeks. Again, the fish problem may be the primary cause of this failure. Both species prefer larger ponds, and in Woodingdean these are invariably stocked with goldfish or other members of the carp family. Crested newt larvae are even more susceptible to fish predation than those of common newts (Dolmen, 1980).

If Woodingdean garden ponds are typical of this kind of habitat throughout the country, it is clear that toads and frogs are going to do moderately to very well under normal management regimes, but that newts are not. The attitudes of local pond owners were generally encouraging; most ranged from being indifferent to mildly interested in their amphibian colonists, and only one had actually removed frogspawn from his pond (and even this had been taken to a local 'wild' pool). Two of the four houses with 2 ponds had turned over one of their pair to frogs, as a deliberate conservation exercise. There was, however, little enthusiasm for giving up fish and newt conservation seems to be the key area in which more education and publicity is needed.

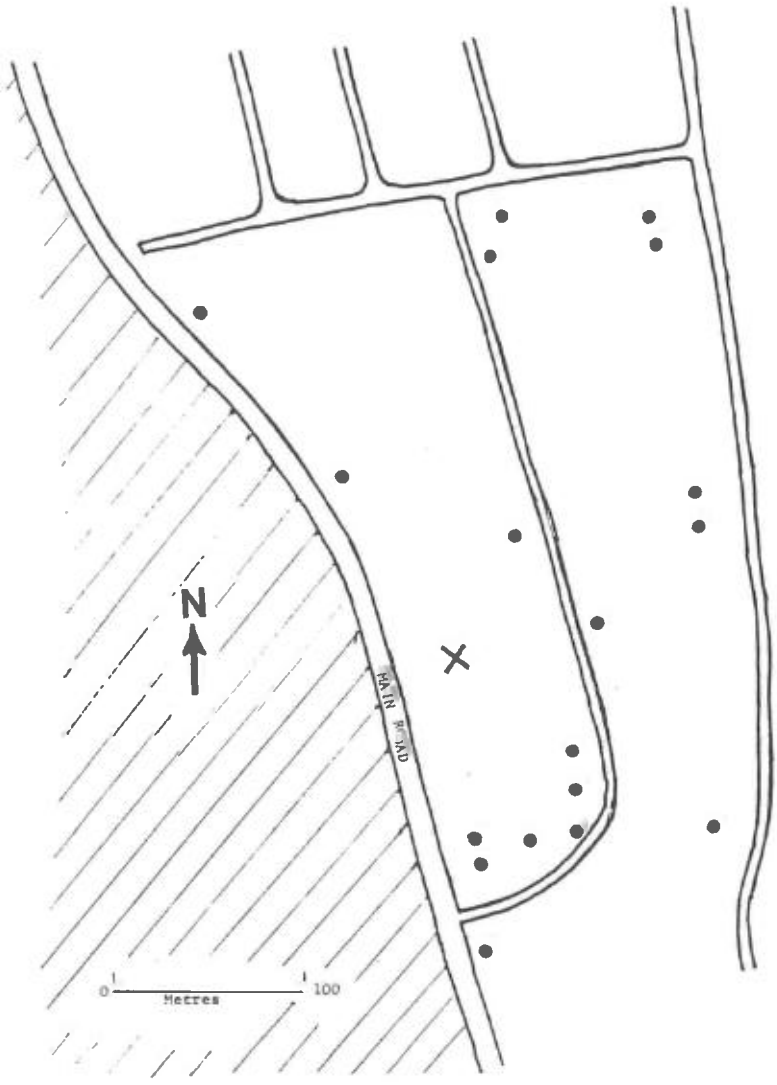

Fig. 1. Study area in Woodingdean
Unshaded areas = garden habitats; /// = open Downland; • = garden pond locations; 'x' = my own garden pond area. Woodingdean is situated on chalk downland with a 30-100 cm overlay of brickearth and a south-facing aspect. Altitude of the study area varies between 77-90 metres above sea level.

	Total	Pond category	
		Without fish	With fish
Number of ponds	20	7	13
Approximate average volume (litres)	2300	400(60-600)	3300(120-21000)
Number with frogs breeding	15	5	10
Number with toads	3	0	3
Number with common newts	3	2	1
Number with other newt species	0	0	0

Table 1. Woodingdean garden ponds

Figures in brackets indicate the ranges of pond sizes in the without and with fish classes.

REFERENCES

Beebee, T.J.C. (1979). Habitats of the British Amphibians (2): Suburban parks and gardens. *Biological Conservation 15,* 241-257.

Dolmen, D. (1980). Distribution and habitat of the smooth newt *Triturus vulgaris* and the warty newt *T. cristatus* in Norway. *Proceedings of the European Herpetological Symposium 1980,* 127-139.

Mathias, J.H. (1974-5). A survey of amphibians in Leicestershire gardens. *Transactions of the Leicestershire Literary and Philosophical Society 69,* 28-41.

THE TAYGETOS LIZARD, *LACERTA GRAECA* BEDRIAGA 1886, AND ITS REPRODUCTION IN CAPTIVITY

BERT LANGERWERF

P.O. Box 82, NL5165ZH Waspik, Netherlands

INTRODUCTION

It is a pity that most "*Lacerta*" keepers stick to *Lacerta viridis, Lacerta lepida* and such kinds of eye-catching species. There is a whole series of *Lacerta* species which is certainly as interesting and attractive as their bigger cousins. I have kept lizards now for many years, and had my first *Lacerta* already 25 years ago, and I must say that I feel myself as attracted to the smaller mountain lizards for the following reasons:

1. In N.W. Europe they are active in outdoor terraria for a much longer part of the year, having a shorter hibernation.
2. They prefer more humidity and less heat, which makes them very suitable to keep here.
3. They don't need large terraria and can be kept in terraria of 2 feet square upwards.
4. There are many species and their relationships with each other are in need of further research.

One of the mountain lizards I keep and want to discuss now is the Greek mountain lizard, *Lacerta graeca. L. graeca* is a greyish brown lizard with block dots on the body and tail, and with lighter dots on the flanks. It is similar to *Podarcis muralis* in size, or slightly larger. The head is flattened, as with many mountain lizards, to enable it to hide in small spaces between rocks. The male, particularly, has bright blue spots above the front legs. There is a good illustration of a pair in "A Field Guide to the Reptiles and Amphibians of Europe" by Arnold, Burton & Ovenden, 1977. Hatchlings have bluish, turquoise tails, but not as bright as in some other mountain lizards.

It lives in the Vassai and Taygetos mountains, of the Peloponnese, Greece (Bischeff 1980), where it occupies humid places. In the Vassai mountains it is found along brooks or moss covered trees. In rocky areas it is replaced by the more robus *Podarcis peloponnesiaca.* In the Taygetos mountains, it is more dominant, and is found in all types of environment when there is sufficient humidity: it is not restricted to trees, but lives more in the rocks and stones along the mountain brooks. Here *Podarcis peloponnesiaca* is absent.

LACERTA GRAECA IN THE TERRARIUM

In late July and early August 1979 my friend Wolfgang Bischoff of Bonn visited the Peloponnese. During that visit he observed many *L. graeca,* but he saw no hatchlings at that time. He took some lizards back to Germany and so I received from him on 19 August, 1979, 4 individuals from the Vassai Mountains, and 5 from the Taygetos. After their first hibernation here in Holland, on the 1st May 1980 I noticed that several females were already very gravid. On 7 May I found three individuals dead from wounds caused by other lizards. As the bigger *Lacerta rudis svanetica* lived in this terrarium too, I assumed that they were guilty, so I isolated two pairs of *L. graeca* in a separate terrarium. Too late, because after an absence of several days abroad, I noticed that it was the females which, just after laying eggs, attacked all the other *L. graeca,* both males and females. This resulted in the death of *all* the *L. graeca.* Even the smallest bite caused the death of the lizards within a week, in spite of my efforts to treat the wounds. I never before observed such a phenomenon in any of my lizards. Also, in later years, in 1981, 1982 and 1983 I did not notice this behaviour in breeding *L. graeca.* At the end of May 1980, I was left with only the eggs of *L. graeca.* Luckily they hatched and after hibernation in the winter of 1980-81 they reproduced within their first year of life. Alas, they only lay 2-3 eggs and so I never bred many, yet I managed to breed them each year from 1980 onwards. Births were: 1980 (8); 1981 (8); 1982(9) and 1983 (8). The following table gives the dates of reproduction.

Date of Oviposition	Date Eggs Discovered	Number of Eggs	Date Eggs Hatched	Length of Incubation (Temp. ± 29°C)		
12 May 1980	12 May 1980	5 (Infertile)	19 June (1)	38 days		
			21 " (2)	40 "		
			22 " (1)	42 "		
± 11 May 1980	25 May 1980	4	5 July (4)	41 "	+ 14 days	(± 15°C)
30 June 1981	3 July 1981	7 (2 clutches)	16 August (2)	44 days	+ 3 days	(± 20°C)
			17 " (1)	45 "	+ 3 "	"
			24 " (1)	52 "	+ 3 "	"
			25 " (1)	53 "	+ 3 "	"
?	18 July 1981	2	31 " (2)	44 "	+ ?	
?	?	?	6 September (1)			
± 1 July 1982	2 July 1982	5	14 August (1)	43 days	+ 1 day	(± 20°C)
?	21 July 1982	?	4 " (3)	14 "	+ ?	"
			6 " (1)	16 "	+ ?	"
			7 " (2)	17 "	+ ?	"
			8 " (2)	18 "	+ ?	"
? 1983	? 1983	?	19 August (1)	?		
			20 " (3)	?		
			21 " (2)	?		
?	23 July 1983	4 clutches of 3-4 eggs each	1 September (1)	40 days	+ ?	
			6 " (1)	45 "	+ ?	

Table 1. Dates of egg-laying and length of incubation of *Lacerta graeca*

Where I was unsure of the number of eggs I found them together with the eggs of other lizards.

During the winter of 1981-82 some *L. graeca* died in a garden terrarium, which had become quite humid. Of the 9 hatchlings of 1982, 7 survived (1 male, 6 females) their first hibernation, even though the weather of spring 1983 was very bad until the end of May; and they even had 4 clutches of 3-4 eggs per clutch, found by me on July 23rd. Perhaps because of the bad weather only two of these eggs hatched. A striking thing noticeable from the table is that in 1980 the period of reproduction was 6-7 weeks earlier than in all the subsequent years when I only worked with lizards born in Holland.

In 1981 and 1983 I noticed that *L. graeca* is able to reproduce within one year of birth, even after hibernation. So it is quite possible that in nature, where the climate is better than here behind glass, *all* lizards reproduce each summer.

FOOD

As are all my other smaller lizards, these are fed chiefly on crickets, which they eat readily. Also in summer they are fed a variety of insects collected wild, such as caterpillars of various sorts, grasshoppers, flies, etc. The adults are also given giant mealworms *(Zophobas morio).* Vitamin D3 ("Aquosum") is always added to the drinking water (about 10,000-20,000 I.U. per litre) and some calcium.

SEX RATIO OF HATCHLINGS

As with other *Lacertidae* I noticed no sign of sexual determination by incubation temperatures: there were always a fair proportion of both males and females.

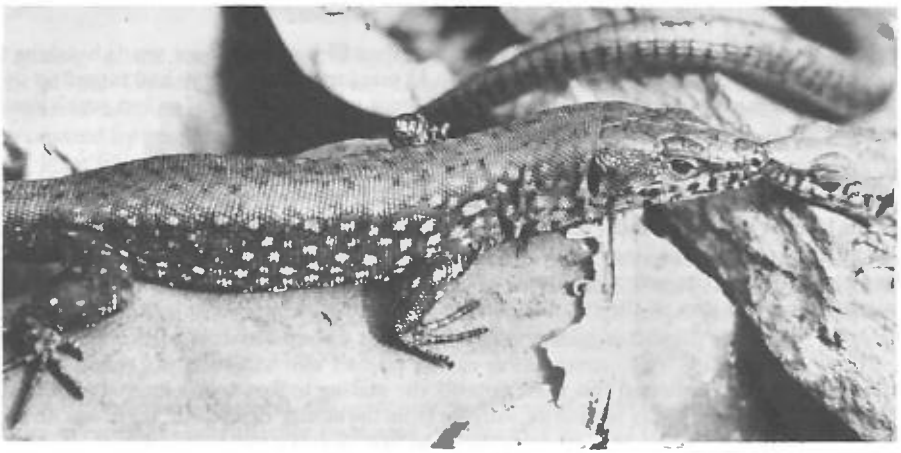

Plate 1. *Lacerta graeca,* female.

REFERENCES

Arnold, E.N., Burton, J.A., Ovenden, D.W. (1977). *A Field Guide to the Reptiles and Amphibians of Europe.* London/Glasgow: Collins.

Bischoff, W.,(1980). Einige Bemerkungen zur Herpetofauna des Peloponnes. *Herpetofauna* **4**: 17-22.

Böhme, W., (1984). *Handbuch der Reptilien und Amphibien Europas.* Band 1. Echsen II. Wiesbaden: Akademische Verlagsgesellschaft.

Matz, G., Weber, D. (1983). *Guide des Amphibiens et Reptiles d'Europe.* p. 154. Paris: De la chaux et Niestlé.

Osteurath, F. (1973). *Untersuchung en Zur intra specifischen Variabilitat der Taygetos-Eidechse, Lacerta graeca.* Unpublished, University of Bonn. 69 pages.

Wettstein, O. (1953). *Herpetologia aegaea.* P. 689: *Lacerta danfordi graeca.* Vienna.

SECOND BREEDING OF CUORA AMBOINENSIS (DAUDIN 1802)

RICHARD INSKEEP

26, Luxor View, Leeds LS8 5JT

INTRODUCTION

In a previous paper, Inskeep — in press, I discussed the maintenance and first breeding of a pair of *Cuora amboinensis.* In this paper I have given details of the same pairs' second breeding in 1983.

OBSERVATIONS

The pair had been separated since they mated in 1982. On 2nd March the male was introduced into the females tank just after it had been cleaned. Mating took place immediately. They remained coupled, underwater, for eight minutes; during which time the female remained passive. She then forced the male to release her and climbed out of the water. The male still had his penis extended. The pair wre left together until 22nd March when the male was removed. During this period the female was never seen to enter the water, she was threatened by the male everytime she went near to the waters edge. Conversely the male was never seen on land.

The first egg was laid on 13th April, 42 days after mating. Vitaline contact was visible by the second day and covered one third of the shell by the fifth day. No increase was noted after this. The second egg was found on 16th May buried in the gravel. As it already showed Vitaline contact it was probably 24-48 hours old. It measured 50 x 25 mm.

On 10th July I decided to open the first egg; it was then 88 days old. (Last year's hatching took place after 74 days.) It contained a dead embryo 33 mm long. The embryo had turned on its side in the egg which may have caused its death. It did not appear deformed as last year's dead-in-shell was.

The second egg chipped on 2nd August, 78 days after laying. Things did not look good at first. The egg was still full of fluid and the embryo still had its eyes closed. However, by the next evening its eyes were open and it seemed alert. It did not emerge from the egg until 9th August, 85 days after laying. At this stage it was more advanced than last year's hatchling in that it had completely absorbed its yolk sac. It took last year's hatchling several days to do this. See Table 1 for growth comparison of the two hatchlings.

DISCUSSION

Extra data has been collected this year; notably the mating to first laying interval of 42 days. I am confident that this figure is valid as, judging from the adults' behaviour, there was no second mating. Incubation parameters were the same as last year so the comparison chipping and hatching date is beginning to show its variation.

TABLE 1

Growth comparison of 1982 and 1983 hatchlings.

	1982	1983
A[1] hatching	11g 38 x 31 mm	11g 38 x 25 mm
A[1] 1 week	12g 41 x 35 mm	12g 41 x 32 mm
A[1] 4 weeks	15g 45 x 38 mm	14g 44 x 35 mm
A[1] 8 weeks	18g 48 x 41 mm	20g 47 x 39 mm
A[1] 12 weeks	22g 51 x 44 mm	24g 51 x 43 mm
A[1] 16 weeks	25g 54 x 44 mm	29g 53 x 46 mm
A[1] 20 weeks	30g 54 x 45 mm	30g 54 x 47 mm
A[1] 24 weeks	33g 55 x 46 mm	31g 55 x 47 mm

REFERENCE

Inskeep, R. (1984). A note on the captive breeding of the Box Turtle *Cuora amboinensis* (Daudin 1802). British Journal of Herpetology, in press. 2/84.

DISTRIBUTION OF AMPHIBIANS AND REPTILES IN GLAMORGAN, SOUTH WALES

P. J. WISNIEWSKI

Senior Education Officer, The Wildfowl Trust, Martin Mere, Burscough, Nr. Ormskirk, Lancashire.

INTRODUCTION

Publication of the Provisional Atlas of the Amphibians and Reptiles of the British Isles (Arnold, 1973), highlighted the inadequacies in our knowledge of the distribution of our native herptiles, particularly the commoner species. It is undoubtedly true that few county recorders make a concerted effort to record these familiar animals and valuable data is lost. Recently, interest has been shown by the Nature Conservancy Council (Cooke & Scorgie, 1983) in the changes in status of the commoner reptiles and amphibians, stimulating many herpetologists to review their own records.

The data presented here are based upon 17 months (5.5.82 to 1.10.83) of personal observation in the three counties of Glamorgan supplemented by the collected records of other naturalists (see Acknowledgements) and information extracted from Gillham (1977 & 1982) and the journals and notes of the Glamorgan Naturalists' Trust.

AMPHIBIAN AND REPTILE HABITAT

The geology of the three counties, West, Mid and South Glamorgan is complex and varied. Much of the Gower Peninsula, West Glamorgan, consists of Carboniferous Limestone interspersed with areas of exposed Old Red Sandstone and bands of Millstone Grit, these latter often covered by peatland. Coal Measures dominate the geology of north Gower, much of the rest of West Glamorgan and norther sections of Mid and South Glamorgan. To the south of a line joining Port Talbot and Cardiff, Mesozoic rocks are occasionally interrupted by outcrops of Carboniferous Limestone.

Despite the depradations of industry upon the landscape, much natural habitat remains. Maps of the three counties, reveal numerous small pools and wetlands; James (1983) estimated a total of two thousand, and although many of those marked on the O.S. maps have been lost in recent years, they have been replaced by new pools formed by mining activity. The current popularity of garden ponds has provided new habitat within urban areas.

Large water bodies are scattered; the most notable lakes and sizeable pools are Broad Pool near Cilibion in central Gower, Kenfig Pool near Porthcawl, Craig-y-Llyn (SN 905037), Pysgodlyn Mawr near Welsh St. Donats and Talygarn Lake near Llantrisant. Mineral extraction has resulted in the extensive Cosmeston Lakes near Barry whilst several large reservoirs have been created, including the huge Eglwys Nunydd near Port Talbot. Several large pools also exist within the parks of towns and cities, e.g. Roath Park Lake in Cardiff. Industrial pollution has adversely affected many major South Wales rivers such as the Taff and Ely (with some improvement in recent years) although others, e.g. the Thaw and Neath, remain relatively unchanged. Man-made canals, e.g. Whitchurch Canal in Cardiff, provide additional amphibian habitat. Other notable wetlands are Crymlyn Bog and Pant-y-Sais Fen near Swansea and Oxwich and Llanrhidian Marshes on Gower.

Abandoned spoil heaps now support good reptile populations but the intensive farming of much of Gower, the southern half of Mid Glamorgan and the Vale of Glamorgan has removed valuable habitat, particularly deciduous woodland, which remains mostly confined to the steeper slopes. In places, dry stone walls do provide additional habitat as does the extensive hedgerow network. The coastal cliffs and crags of Gower and much of the south facing coastline of Glamorgan provide a vital refuge from agriculture, which often extends to the cliff edge. Similar refuges exist in the extensive sand-dune systems, now mostly protected as nature reserves or SSSIs, e.g. Whiteford, Oxwich, Crymlyn and Kenfig Burrows and Merthyr Mawr Warren.

The more rugged, mountainous, northern parts of Glamorgan are sparsely populated but extensive afforestation with conifers has eliminated much reptile and amphibian habitat.

DISTRIBUTION OF SPECIES

The distribution of each species has been plotted on a 10 km square basis (Figs 1—9) and incorporates records from the Provisional Atlas. In addition, the number of 5 km and 10 km squares in which each species has been observed in summarised in Table 1, including the number of pre- and post- 1960 10 km square records given in the Provisional Atlas. The number of Atlas records confirmed by the current survey is also given. Some estimation of the known range for each species can be obtained by treating 10 km square records from the current survey plus all Atlas records as a theoretical maximum and all records minus unconfirmed post-1960 records as a theoretical minimum. These ranges are given in discussion of the distribution of individual species, below.

Fig. 1. Common Frog *(Rana temporaria)*
Estimated range 68% of survey area. This range is undoubtedly an under-estimate and intensive investigation of the north-western uplands would probably yield further records. Scarcity of ponds in parts of the south coast have resulted in a sparse population. Many colonies exist within town centres, particularly in garden ponds and in 1983 the earliest record for frogspawn was in early January from one such pond in the centre of Cardiff.

Fig. 2. Common Toad *(Bufo bufo)*
Estimated range 49 — 51% of survey area. Lack of deeper pools may restrict the distribution of this species although mining has created some suitable habitat. Large population at Kenfig Pool and fairly common in those squares where it occurs.

Fig. 3. Smooth Newt *(Triturus vulgaris)*
Estimated range 39 — 44% of survey area. All newts are less easy to observe than the anurans. The Smooth Newt is undoubtedly under-recorded but much commoner than generally expected for Wales. Much suitable habitat exists and mining has created many new ponds.

Fig. 4. Palmate Newt *(Triturus helveticus)*
Estimated range 27% of survey area. Very scattered and apparently less common than the Smooth Newt. Populations exist in the Bridgend area, some in newly created ponds. Otherwise, present in the uplands of the north-east.

Fig. 5. Crested Newt *(Triturus cristatus)*
Estimated range 24% of survey area. Apparently the least widespread of the newts and thought to be generally declining in Britain. Good populations still exist in certain parts of Glamorgan, particularly in the Bridgend area where several recent ponds are occupied. Also to be found within Cardiff where one breeding site comprises a fairly bare pool within a park, surrounded for some distance by nothing but closely mown grass. Further searching would probably reveal more populations, particularly in the south.

Fig. 6. Slow-worm *(Anguis fragilis)*
Estimated range 32 — 42% of survey area. Particularly common in the south and often to be seen basking upon dry spoil heaps. Good populations on Flatholm. Few records from the north but undoubtedly under-recorded.

Fig. 7. Common Lizard *(Lacerta vivipara)*
Estimated range 34 — 44% of survey area. Distribution similar to previous species. Common on Flatholm and on most maritime cliffs.

(No Fig.)Sand Lizard *(Lacerta agilis)*
Two old unsubstantiated records from two 10 km squares, one from Whiteford Burrows and the other from Margam Burrows near Port Talbot. In the latter case, suitable habitat has been largely destroyed by the construction of the B.S.C. works.

Key

Large dot:—	Record from current survey
Small dot:—	Unconfirmed post-1960 record from the Provisional Atlas.
Cross:—	Unconfirmed pre-1960 record from the Provisional Atlas.

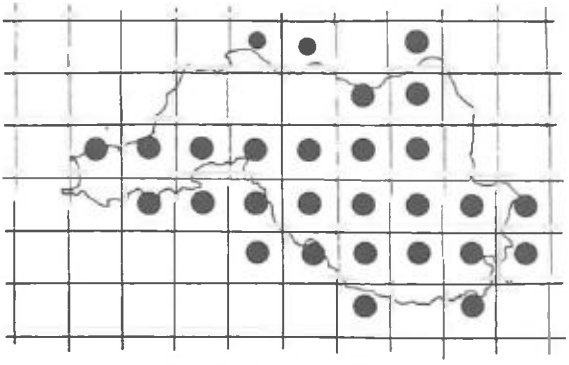

Fig. 1. Common Frog

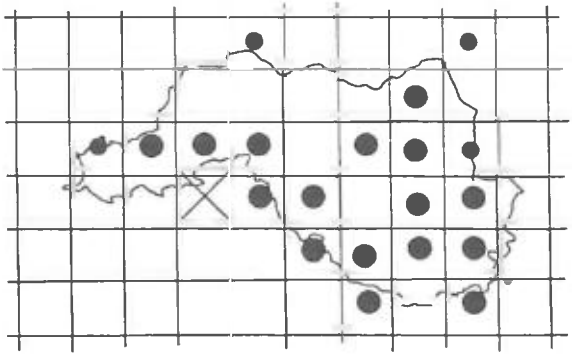

Fig. 2. Common Toad

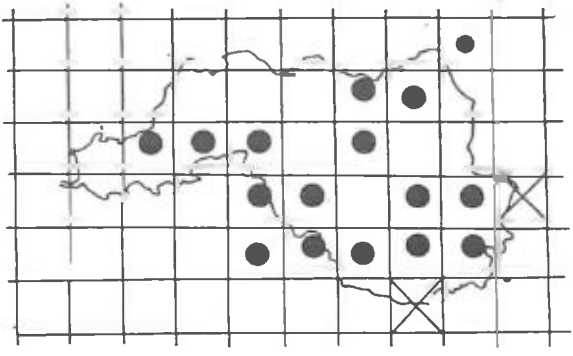

Fig. 3. Smooth Newt

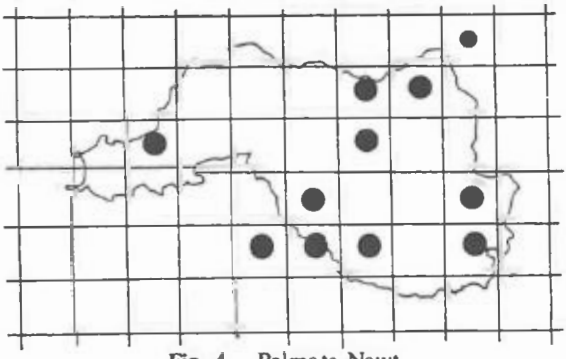

Fig. 4. Palmate Newt

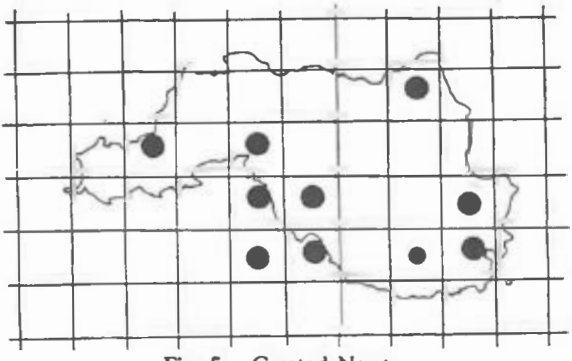

Fig. 5. Crested Newt

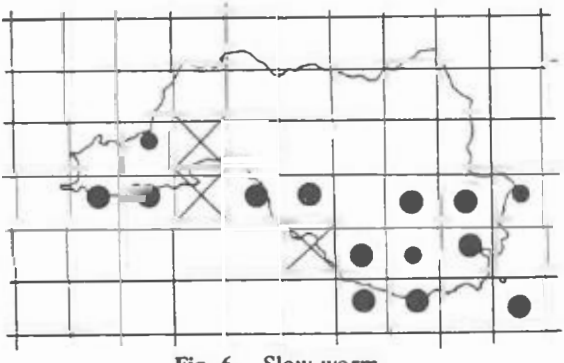

Fig. 6. Slow-worm

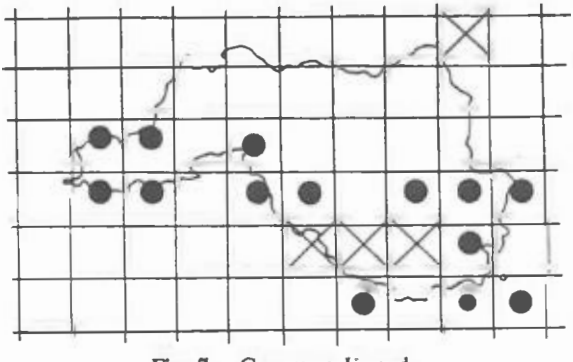

Fig. 7. Common Lizard

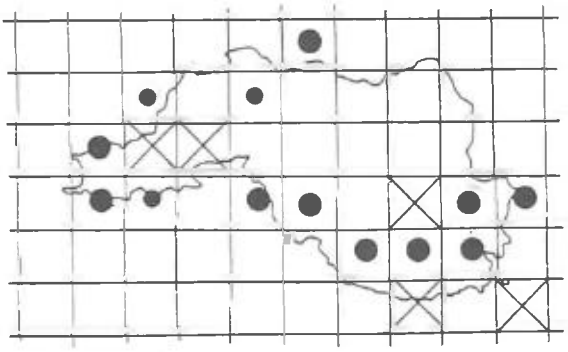

Fig. 8. Grass Snake

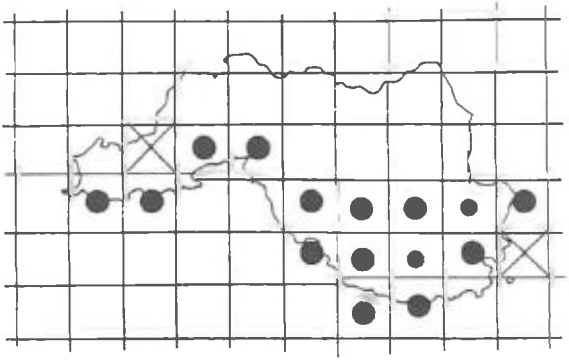

Fig. 9. Adder

Fig. 8. Grass Snake *(Natrix natrix)*
Estimated range 32 — 44% of survey area. Probably under-recorded. Some records from the north-west. Likely to be present in the damper upland areas in the rest of north Glamorgan (unlike the Adder). Its distribution in the south of Glamorgan is closely associated with the presence of larger water bodies and surrounding wetland.

Fig. 9. Adder *(Vipera berus)*
Estimated range 37 — 42% of survey area. Probably confined to the drier south (as indicated). Common on spoil heaps and in forestry clearings. Melanistic specimens frequent in south Gower.

CONCLUSIONS

Despite extensive observations, the records presented here are far from complete. In particular, the northern parts of Glamorgan (the 'Valleys') are under-recorded due to the sparse human population, the ruggedness of the terrain and widespread afforestation. Further fieldwork is required in this region but herptile populations are probably scattered and small.

Records for reptile species were disappointing since, unlike amphibians, they do not congregate for breeding and are thus more difficult to observe.

Despite the effects of industry, agriculture, forestry and urbanisation, the picture is not a gloomy one. Good populations of the comoner amphibians and reptiles persist and the declining Crested Newt is widespread, even in urban areas.

TABLE 1. SUMMARY OF HERPTILE DISTRIBUTION IN GLAMORGAN BY 5 km and 10 km SQUARES

	No. 10 km Squares	No. 5 km Squares	No. 10 km pre 1960 Atlas records	No. pre 1960 records confirmed	No. 10 km post 1960 Atlas records	Nos. post 1960 records confirmed
Common Frog	26	62	2	2	19	17
Common Toad	15	34	3	2	10	6
Smooth Newt	15	23	3	1	4	3
Palmate Newt	10	13	4	4	2	1
Crested Newt	9	11	2	2	2	1
Slow-Worm	10	15	5	2	8	5
Common Lizard	13	21	6	2	6	5
Grass Snake	10	10	6	1	9	6
Adder	13	20	6	4	4	2

Total no. Squares within Glamorgan 5 km = 124

10 km = 41

ACKNOWLEDGEMENTS

I would like to thank D. Edwards, Dr. M. Gillham, D. Gregson, M. Grist, G. James, S. Moon, W. Nelson, L. Paull, M. Simmonds and Mr. & Mrs. J. Raum for records provided and the Glamorgan Naturalists' Trust who made the work possible.

REFERENCES

Arnold, H.R. (1973). *Provisional Atlas of the Amphibians and Reptiles of the British Isles.* Abbots Ripton: Biological Records Centre.

Cooke, A.S. & Scorgie, H.R.A. (1983). *The Status of the Commoner Amphibians and Reptiles in Britain.* Nature Conservancy Council: Focus on Nature Conservation, No. 3.

Gillham, M.E. (1977). *The Natural History of Gower, South Wales.* D. Brown & Sons.

Gillham, M.E. (1982). *Swansea Bay's Green Mantle.* D. Brown & Sons Ltd.

James, G. (1983). Let's look into a pond in 1983. *GNAT,* **6**: 6 — 7.

NOTES ON THE HERPETOFAUNA OF SOUTHERN MALAWI

SIMON TONGE (1) and DAVID MORGAN (2)

(1) Jersey Wildlife Preservation Trust, Les Augres Manor, Trinity, Jersey, C.I.

(2) Transvaal Snake Park, Halfway House, Transvaal, South Africa

INTRODUCTION

Over the past twenty years, the herpetofauna of southern Malawi has become well known compared with that of most areas of Africa. Stevens (1974) produced a comprehensive checklist of the reptiles and amphibians of the south-eastern area of the country, and Morgan (1979, 1981) has reported on collections made in the same general area. More detailed treatments of particular groups include Stewart (1967) and Sweeney (1961). Before our visit to the country, D.M. consulted the doyen of African herpetologists, D.G. Broadley, who was kind enough to prepare for him a checklist of species of reptiles and amphibia recorded from the entire country.

This paper concerns a trip to Malawi undertaken by the authors between 21st December 1983 and 13th January 1984. The following localities were investigated (also see map):-

1. City of Blantyre, in particular Namiwawa and Sunnyside districts —
   1a) Mudi River (24th and 29th December)
   1b) Ndirande Mountain (28th December)
   1c) Burn Dam, Limbe (28th December)
2. Thyolo (Tunga Dam and roads through the tea estates) (27th December)
3. Lengwe National Park on the west bank of the Shire River between Chikwawa and Nchalo (30th December).
4. Streams and rivers around the base of Mulanje Mountain (8th and 10th January, 1984).
5. Zomba Plateau (Mulunguzi Dam and Mandala Falls) (31st December)
6. Kachulu jetty and Nchenga village on the shore of Lake Chilwa (31st December)
7. Nkhudzi Bay on the south-western shore of Lake Malawi (2nd-6th January)
8. Cape Maclear at the northern tip of the Nankhumba Peninsula, southern Lake Malawi (3rd January)

The physiography of the area in question has been described by Stevens (1974) and will not be discussed again here. Both the authors are former residents of Malawi and were visiting the country for the first time in five and three years, respectively. We were both struck by the increase in cultivation, particularly in and around Blantyre, that had occurred during our absence. There seems to be little doubt that many species of herptile have decreased in both numbers and range during that time (e.g. the apparent disappearance of *Philothamnus* from the Burn Dam in Limbe). This article is intended to provide a 'reference point' for future workers trying to document ecological damage in that part of Africa.

The authors heard second-hand reports of two species that have not been seen in Malawi since Loveridge (1953) reported on his collections. The first of these is the Caecilian *Scolecomorphus kirkii,* which two friends reported having seen on Ndirande Mountain some months previously. This would have been a new locality record if we had been able to verify it. The second is the 'Leaf Chameleon' *Rhampholeon b. brachyurus,* which was reported from a friend's garden just prior to our visit. Unfortunately, he was unable to locate the sepcimen once we had arrived in the country, so we could not confirm the identification. This subspecies is found only in the Shire Highlands, and Stevens (1974) reports that it is restricted to 'gallery forest bordering streams'. As this is possibly the most degraded habitat in Blantyre, there may be grounds for some concern over the long-term future of this form.

Map of southern Malawi showing localities visited during the course of the trip.

AMPHIBIANS

Xenopus l. laevis. Localities: 1a, 1c, 2. Not collected, common in deeper, permanent pools where it is often observed rising for air.

Bufo gutturalis. Localities: 4. Found on a golf course in bright sunshine.

Bufo maculatus. Localities: 2, 7. Active at 15.00 hr (2) and at 20.00 hr (7).

Bufo sp. Localities: 4, 5. Many newly-metamorphosed juveniles found alongside shady streams proved impossible to identify to species.

Breviceps mossambica. Localities: 1. One specimen found in a cool, shady garden at 16.00 hr; another at 20.00 hr in the gutter alongside a very busy road in the middle of Blantyre.

Rana angolensis. Localities: 5. Some recently metamorphosed frogs alongside the Mulunguzi Dam, Zomba Plateau were identified as this species from Stewart (1967).

Ptychadena spp. Localities: 1a, 4, 5, 6. Speces belonging to this genus were common at several localities. Those from Blantyre were probably *P. oxyrhynchus* but no attempt was made to identify the others. *Phrynobatrachus (ukingensis) mababiensis.* Localities: 4. This species was common in streams around the Mulanje Golf Club. One specimen was caught and photographed.

Phrynobatrachus natalensis. Localities: 7. Two tiny frogs, captured in a swampy area at Nkhudzi Bay, are tentatively identified as this species from Stewart (1967).

Arthroleptis stenodactylus. Localities: 1. One specimen was captured in the same garden as the *B. mossambica.* Many frogs calling at night in Blantyre were thought to be this species, although no attempt was made to seek out the callers.

Hemisus marmoratum ssp. Localities: 1, 3. One specimen was captured at night on the forecourt of Blantyre Sports Club, and a female on eggs was discovered under a log at the North Hide waterhole, Lengwe National Park. This appears to be the first record of this species from Lengwe and only the second for the Lower Shire (Stevens, 1974).

Chiromantis xerampelina. Localities: 3. Foam nests of this species were seen over several waterholes and temporary pools. One pool contained many thousands of newly-hatched tadpoles.

Afrixalus b. brachycnemis. Localities: 1c. One specimen was seen and photographed, basking in bright sunshine on a Water Hyacinth.

Afrixalus f. fornasinii. Localities: 6, 7. Specimens were commonly found in the lef axils of Aloes, Sisols and other broad-leafed plants during the day.

Hyperolius marmoratus albofasciatus. Localities: 1c, 2, 5, 7. There seems to be some confusion over the specific name of this form. Stewart (1967) uses *marmoratus* whilst Stevens (1974) uses *parallelus.* We have followed Passmore and Carruthers (1979). It is a common species, found almost everywhere.

REPTILES

Pelomedusa subrufa. Localities: 8. One specimen was brought to us by a native who had captured it locally.

Pelusios sinuatus. Localities: 7. One specimen was found in the swampy area behind the beach at Nkhudzi Bay.

Cycloderma frenatum. Localities: 8. Two recently-hatched juveniles were brought to us from the flooded area near Cape Maclear, where the species is known to breed (Morgan, 1981). When we investigated the area on 3.1.84, it had almost completely dried up and no terrapins could be found. The native name is Nkasi. Dimensions were as follows:

1) Carapace length: 62.0 mm, Plastron length: 59.0 mm, Shell height: 20.0 mm, Carapace width: 45.8 mm, Weight: 29.0 g.

2) Carapace length: 50.0 mm, Plastron length: 49.8 mm, Height: 20.9 mm, Carapace width: 38.5 mm, Weight: 13.0 g.

Kinixys b. belliana. Localities: 7. One specimen, an adult male, was brought to us by a native who had captured it locally. We photographed and released it.

Hemidactylus mabouia. Localities: 1, 7. The common 'House' Gecko, found both in Blantyre and at Lake Malawi.

Hemidactylus platycephalus. Localities: 7. Specimens were taken around Nkhudzi Bay and one specimen was seen in thick scrub on top of Nkhudzi Hill.

Hemidactylus spp. Localities: 3. Geckos assignable to this genus were common on the walls and roofs of hides and rondavels in Lengwe National Park. Our identification of *H. platycephalus* was later refuted by Dr. Wulf Haacke of the Transvaal Museum, who stated that the photos looked much more like *H. tasmani,* a species not recorded from Malawi before. Regrettably, a specimen was not taken and the matter must remain in doubt until a specimen is obtained.

Pachydactylus bibroni. Localities: 7. One adult specimen was brought to us by a native who had caught it locally.

Lygodactylus capensis. Localities: 1, 7. A common diurnal commensal species.

Lygodactylus angularis. Localities: 2. One specimen was seen on a tree in a garden in the tea estates.

Agama kirkii. Localities: 1a, 1b. Common anywhere that has rocks or boulders.

Agama cynogaster. Localities: 1a. One female specimen seen on a tree beside the Mudi River was probably this species.

Agama aculeata armata. Localities: 7. One specimen was seen sunning itself on a tree stump in a maise field at about 10.00 hr. There is confusion over the proper specific name. Welch (1982) calls Malawian specimens *A. hispida mertensi,* but following McLachlan (1981) *A. hispida* is a South African endemic, so *A. h. mertensi* is here regarded as a junior synonym of *A. aculeata armata.*

Chamaeleo dilepis Localities: 1a, and several specimens were seen on the road between Mangochi and Nkhudzi Bay. A common species.

Chamaeleo melleri. Localities: 1. Six specimens, probably all female, were collected in Blantyre. One of them was definitely gravid; she laid premature eggs in a collecting bag on the flight back to South Africa; but the other five did not appear to be so. Possibly they had just laid eggs and were making their way back to the trees from the laying site when caught. Four females were weighed and measured, as follows:—

	Total length (mm)	**SVL (mm)**	**Weight (g)**
1)	445	210	108
2)	465	225	180
3)	463	213	114
4)	488	230	

The authors heard convincing reports of two-horned chameleons being found around Blantyre. There is a two-horned *C. melleri* in the Transvaal Museum and it seems possible that this species is sexually dimorphic in respect of the number of horns, males having two and females one. That this has not been reported before is not surprising as males practically never descend from the tops of high trees, so are rarely caught. Sexual dimorphism is common in *Chameleo* species.

Mabuya maculilabris. Localities: 4. One specimen was seen and photographed on a flying-ant trap beside a stream near Mulanje Golf Club. It was identified as this species from Broadley (1974).

Mabuya quinquetaeniata margaritifer. Localities: 1a, 1b, 7, 8. This species is strongly associated with rocks. It was found in *Brachystegia* woodland on Ndirande Mountain but not in evergreen forest.

Mabuya lacertiformis. Localities: 7. The species is common rocks both on the shoreline of, and behind, Nkhudzi Bay.

Mabuya s. striata. Localities: 1, 7, 8 and Lilongwe Airport. A very common commensal species.

Mabuya varia. Localities: 1a, 2, 7. A gravid female of this common species was captured on a roadside verge in Thyolo.

Afroablepharus wahlbergi. Localities: 1. A tiny juvenile was captured in a garden in Sunnyside.

Gerrhosaurus flavigularis. Localities: 1a, 6, 7, 8. A common species, though very hard to capture.

Gerrhosaurus validus. Localities: 7. One specimen was seen on a dry, thicket-covered slope at the north end of Nkhudzi Bay.

Ichnotropis squamulosa. Localities: 7. Several specimens were seen and one was captured alongside sandy paths at the base of Nkhudzi Hill.

Varanus n. niloticus. Localities: 7, 8. A common species at Lake Malawi. One juvenile specimen was captured on 5.1.84. Specimens basking on rocks along the shoreline can be located from a boat; one person can then approach the rock by swimming underwater, leap out and grab the lizard before it is aware of the person's presence. This is a highly successful technique. Catching an alert monitor in the rocks is practically impossible.

Typhlops schlegelii mucruso. Localities: 1. Several DOR (dead on road) specimens were seen in Blantyre.

Python sebae natalensis. Localities: a specimen that had been captured at Liwonde was donated to us, and it was taken back to South Africa. Subspecific identification is from Broadley (1983).

Natriciteres variegata sylvatica. Localities: 5. One dead and one live specimen were found beside the Mulunguzi Dam. The latter was captured mid-afternoon, following a brief rain shower. It was probably hunting frogs in the short grass around the dam.

Natriciteres olivacea. Localities: 7. One specimen was found in the swampy area behind Nkhudzi Bay. It was freshly dead in a hippo foot-print, though did not appear damaged.

Lycodonomorphus leleupi mlanjensis. Localities: 1a. This species can still be found in the deeper pools of the Mudi stream.

Lamprophis f. fuliginosus. Localities: 1, and a DOR specimen was found at the top of the Kasupe escarpment on the main road to Zomba. The Blantyre specimen was a juvenile, caught on a friend's verandah.

Philothamnus angolensis. Localities: 1a, 4. This species is common on the tops of bushes, alongside streams. It could not be found at the Burn Dam in Limbe, a locality where it used to be very abundant.

Crotaphopeltis hotamboeia. Localities: 1. A single, white-lipped juvenile was found in a damp, shady garden in Sunnyside.

Telescopus s. semiannulatus. Localities: 7. A single, newly-hatched juvenile was brought to us by a native.

Rhamphiophis oxyrhynchus rostratus. Localities: 7. A juvenile male was captured alongside a bamboo fence around the garden of our cottage at Nkhudzi Bay. It was very thin and, while still being handled just after capture, took and ate a *Hemidactylus mabouia*! Total length: 369 mm, SVL: 274 mm, Weight: 9.5 g.

Psammophis subtaeniatus orientalis. Localities: 7. One juvenile was captured on top of a wall behind the beach, and an adult was seen and photographed in a dense thorn bush alongside the access road to Nkhudzi Bay.

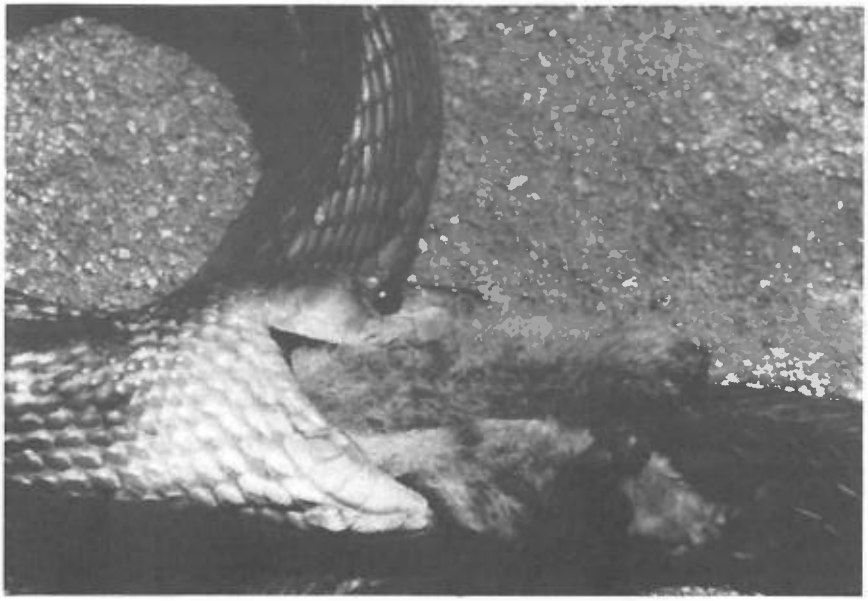

Plate 1. *Dendroaspis polylepis* killed while consuming a *Galago* sp.

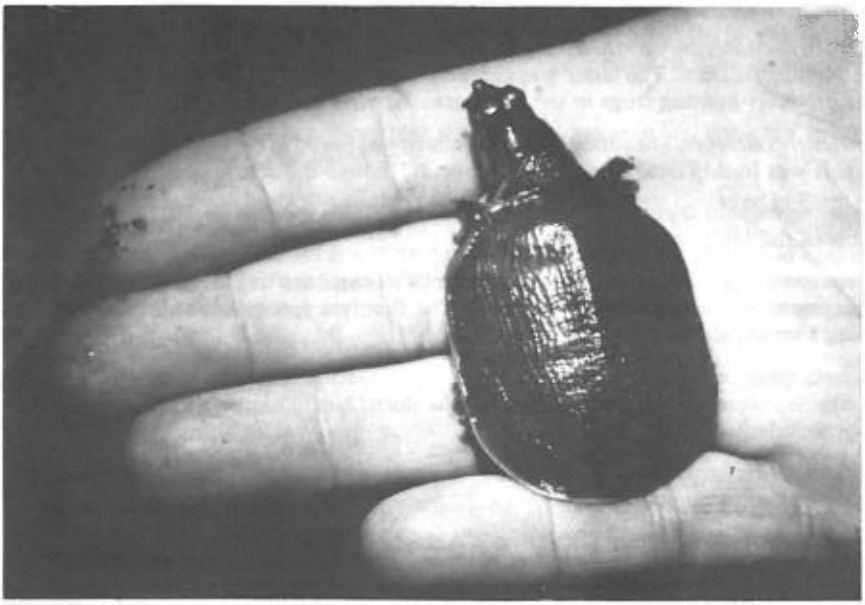

Plate 2. Hatchling *Cycloderma frenatum*

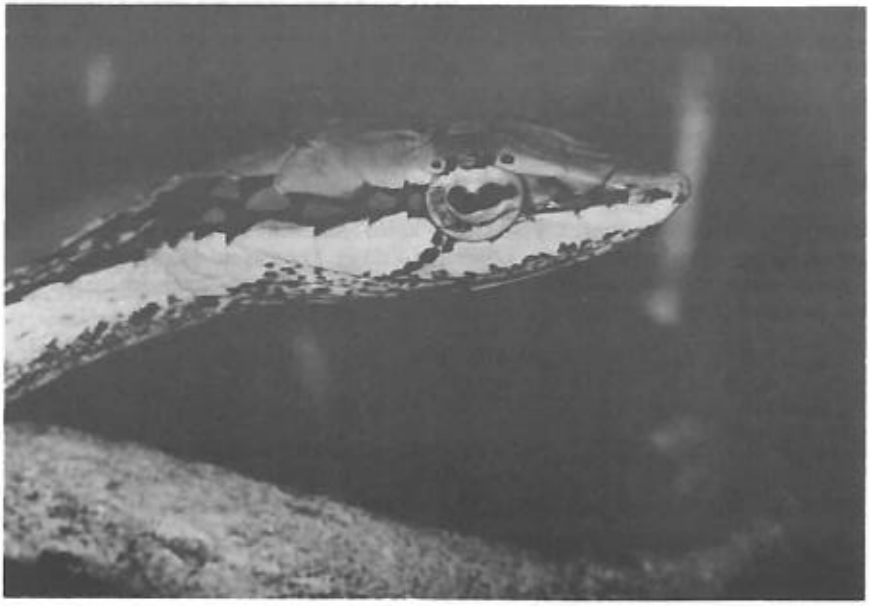

Plate 3. Juvenile *Thelotormis capensis oatesi.*

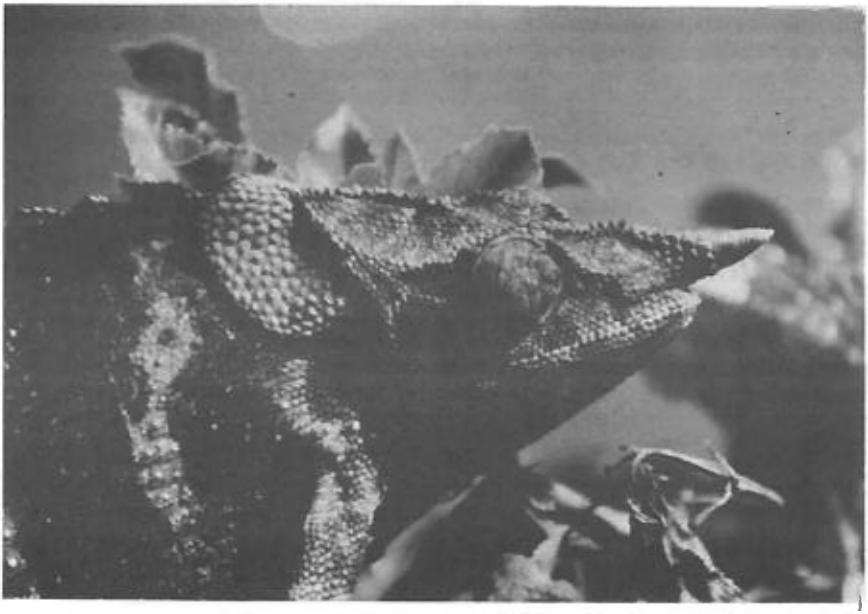

Plate 4. Adult Female *Chamaeleo melleri*

Psammophis phillipsi. Localities: 7. One adult female specimen was captured in a large bush about 100 yards west of the main Liwonde-Monkey Bay road, just opposite the Nkhudzi Bay turning. (Total length: 1083 mm, SVL: 925 mm, Weight: 170.4 g).

Thelotornis capensis oatesi. Localities: 7. Two adult males and one juvenile were captured in trees a the base of Nkhudzi Hill. One adult was digesting a *Chameleo dilepis.* Dimensions of the two adults are as follows: 1) Total length: 1400 mm, SVL: 1050 mm, Weight: 62.0 g. 2) Total length: 1062 mm, SVL: 780 mm, Weight: 43.7 g.

Dendroaspis polylepis. Localities: 7. Two freshly-killed specimens were obtained. The first was a beheaded, dark green juvenile, killed in Nkhudzi Village. The second was a 2280 mm (185 mm SVL) adult, which had been killed in the act of swallowing a *Galago senegalensis.* Mambas are usually uncommon and hard to find.

Dendroaspis angusticeps. Localities: one adult male was located and captured at Sucoma in the Lower Shire Valley on 11.1.84. It was taken back to the TSP and was ultimately exported to the U.S.A. (Total length: 1012 mm, SVL: 798 mm, Weight: 43.5 g.).

Causus defilippi. Localities: 4. One female specimen was captured on the bank of a small stream near Mulanje Golf Club. It was active at 12.30 hours and was captured without difficulty, using pilstrom tongs. (Total length: 210 mm, SVL: 182 mm, Weight: 19.8 g.).

ACKNOWLEDGEMENTS

Many people contributed to the success of this trip and there is not enough space here to thank them all individually. However, S.J.T. would like to express particular thanks to Bob and Tess Renshaw, his hosts during his stay in Malawi, and D.R.M. would like to thank both his host, Gray Bowden and his colleagues at the TSP, Richard Boycott and Rod Patterson, for their support and encouragement.

REFERENCES

Broadley, D.G. (1974). A review of the Mabuya maculilabris group in South-eastern Africa. *Arnoldio (Rhodesia)* **23** (6): 1.10.

Broadley, D.G. (1983). *Fitzsimons Snakes of Southern Africa.* Delta Books, South Africa.

Loveridge, A. (1965). Zoological results of a fifth expedition to East Africa III. Reptiles from Nyasaland and Tete. *Bull. Mus. Comp. Zool. Harv.* **110** (3): 143-322.

McLachlan, G.R. (1981). Taxonomy of Agama hispida (Sauria: Agamidae) in Southern Africa. *Cimbebasia Series* **A 5** (6): 219-227.

Morgan, D.R. (1979). Notes on a herpetofauna collecting trio to Malawi, Central Africa. *Herptile* **4** (3): 24-28.

Morgan, D.R. (1981). Report on a second collecting trip to Malawi, Central Africa. *Herptile* **6** (2): 31-36.

Passmore, N. and Carruthers, V. (1979). *South African Frogs.* Witwatersrand University Press, Johannesburg.

Stevens, R.A. (1974). An annotated checklist of the amphibians and reptiles known to occur in south-eastern Malawi. *Arnoldia (Rhodesia)* **30** (5): 1-22.

Stewart, M.M. (1967). *Amphibians of Malawi.* State University of New York Press, Albany, New York, U.S.A.

Sweeney, R.C.K. (1961). *Snakes of Nyasaland.* p.p. 200 + xi. Zomba: Nyasaland Society and Nyasaland Government.

Welch, K. (1982). *Herpetology of Africa.* Robert E. Kreiger Publishing Company, Malabar, Florida, U.S.A.

AMPHIBIANS AND REPTILES IN MONTENEGRO, YUGOSLAVIA

R. MEEK

8 Mountfield Road, Waterloo, Huddersfield, England

INTRODUCTION

In 1978 and 1983 field trips were made to Montenegro in southern Yugoslavia to record field data on Hermanns tortoise, *Testudo hermanni* (Meek and Inskeep, 1981, in press). During the study periods 16 additional species of amphibians and reptiles were observed. There are several reports in the literature concerning the Yugoslavian herpetofauna. For example, Peaker and Peaker (1968) located four amphibians and five reptile species in the Rovinj region and Mattison (1982) seventeen reptiles and two amphibian species from several areas on the Adriatic coast. With R. Inskeep, the author reported on ten reptiles and two amphibian species located during the 1978 study period (Meek and Inskeep, 1979). This paper presents new observations on several of these species, in addition to six species not previously recorded. A checklist of the Yugoslavian herpetofauna can be found in Brelih and Dzukic (1974).

GEOGRAPHY

The coastline of Yugoslavia consists of large numbers of small islands, peninsulas, straits and gulfs. These were formed at the end of the last Ice Age when a rise in the sea levels resulted in a partial submergence of a former mountain range with the effect that the river valleys were flooded and the ancient mountain ridges transformed into islands and peninsulas. The present coastal region now consists of a narrow plain limited on the western side by the Adriatic sea and to the east by the limestone based Dinaric Alps which rise abruptly from the edge of the plain. The limestone base of these mountains has an important effect on the geography of the region since being porous it drains much of the regions rainfall. The effects are that although the region receives a good deal of rain it is one of the most waterless areas in Europe with few ponds or larger standing bodies of water. Suumer air temperatures here often exceeed 30°C with the January isotherm 9°C.

PRINCIPAL SITES

Altogether five areas were investigated, their locations are shown in Figure 1.

Area 1 Extensive marshes drained by a series of ditches. Part of this area is shown in Plate 1.

Area 2 A series of fields and ditches bordering the town of Budva.

Area 3 Low terraced mountains bordering the road east from Budva.

Area 4 Mixed scrubland intersected with small ditches. This was the most intensively searched area. Plate 2 shows a section with dense vegetation, a view of more open habitat here can be found in Meek and Inskeep (1981).

Area 5 Low terraced mountains bordering the road north of the town of Petrovac.

SPECIES LIST

Amphibia

Urodela

Salamandridae

Triturus vulgaris (Linné, 1758)

One adult observed in a ditch on the perimeter of the area shown in plate 2 (area 4). A juvenile was found under refuse at area 1.

Anura

Bufonidae

Bufo viridis (Laurenti, 1768)

One juvenile located at area 2 after heavy rainfull only 100m or so from the sea shore.

Bufo bufo (Linné, 1758)

One adult female moving through dense water reeds in a ditch in late afternoon after rain at area 1.

Ranidae

Rana ridibunda (Pallas, 1771)

Large numbers observed in ditches at areas 1 and 2. Several were caught after leaping from basking sites on the banks. In broader sections of water they remained in shallow sections after being chased but in narrow stretches dived beneath aquatic vegetation. First located when heard calling loudly.

Reptilia

Chelonia

Testudinidae

Testudo hermanni (Gmelin, 1789)

Found in scrubland in area 4. Several juveniles were found dead on the road north of Budva.

Emididae

Emys orbicularis (Linné, 1758)

Adults and juveniles found at areas 1 and 4. Found in association with *Mauremys caspica rivulata* at area 1 where both species shared basking sites. Very alert and dived when approached. Frequently seen floating at the surface with just the head above water.

Mauremys caspica rivulata (Valenciennes, 1833)

Adults and subadults found in areas 1, 2 and 4. Most animals were initially observed basking (Plate 4) but others were seen moving along stream beds. A subadult retreated beneath a rock on a riverbed when chased. The systematics of the three Mediterranean races of *M. caspica* have been studied and revised by Busack and Ernst (1980). They favour the retention of *M.c. rivulata* as a subspecies.

Squamata

Sauria

Gekkonidae

Hemidactylus turcicus (Linné, 1758)

Several individuals observed and one caught on rockfaces by the roadsides in areas 3 and 5.

Lacertidae

Lacerta oxycephela (Dumeril and Bibron, 1839)

One animal observed at close quarters on a rockface in area 3. Found here in association with *H. turcicus*.

Lacerta viridis (Laurenti, 1768)

Very common in areas 2, 3, 4 and 5. Usually occupied habitats with dense thorny bush but was frequently seen running across large clearings in area 4. Numerous juveniles were observed in dense bush in area 4. These had the four narrow white stripes typical of the young of this species (Arnold *et al* 1978).

Lacerta trilineata (Bedriaga, 1886)

Located in area 3 living on mountain slopes by the roadside. Juveniles were seen in dense bush by the roadside. A very large male was found dead on the road here.

Podarcis melisellensis (Braun, 1877)

Very common in area 1 on the banks of ditches among sparse plant growth. Often observed basking.

Anguidae

Anguis fragilis (Linné, 1758)

Located in areas 1 and 4 usually under logs, stones or refuse. A large number of both adults and juveniles were found under a board in area 1.

Ophisaurus apodus (Pallas, 1775)

A common reptile in areas 4 and 5 in fields (4) and on roadsides (5). Appears to favour areas with good open basking sites and dense bush for cover. Several were observed climbing in low bush (area 4). All individuals caught were adults except for a dead juvenile found on a pathway in area 4. Several animals found in 1983 had extensive scale damage (Plate 4), probably a result of attacks by feral cats. One partly eaten animal was also found. Collected animals did not attempt to bite, but responded by twisting their bodies along the longitudinal axis; none shed any part of their tail. A captured animal in northern Yugoslavia has been observed to regurgitate a mouse and a large snail (J. Armitage, personal communication).

Serpentes

Colubridae

Elaphe longissima (Laurenti, 1768)

One adult observed and a juvenile captured in area 4. The adult was seen in mid-afternoon moving through bushes, the juvenile in early evening moving along the grass covered perimeter of a densely bushed area.

Coluber gemonensis (Laurenti, 1768)

Common in areas 2, 3 and 4. Usually observed moving across clearings or basking on piles of rocks. A juvenile was caught while swimming in a ditch in area 2. In area 3 they were found in low bush by the roadside where two adults were also found dead on the road.

Natrix natrix (Linné, 1758)

Abundant in the grass covered marshy plain in area 1. Observed basking on tufts of grass after heavy rain. A subadult was located under refuse in association with a juvenile *T. vulgaris* and several *A. fragilus*. Apparently these snakes were of the *persa* (Pallas, 1814) subspecies although the status of this and several other races of *N. natrix* are now in question (e.g. see Thorpe, 1979; 1980).

TABLE 1

Summary of amphibian and reptile species observed in Montenegro and their site locations.

SPECIES	SITES 1	2	3	4	5
Triturus vulgaris	x			x	
Bufo viridis		x			
Bufo bufo	x				
Rana ridibunda	x	x			
Testudo hermanni				x	
Emys orbicularis	x			x	
Mauremys caspica rivulata	x	x		x	
Hemidactylus turcicus			x		x
Lacerta oxycephela			x		
Lacerta viridis		x	x	x	x
Lacerta trilineata			x		
Podarcis melisellensis	x				
Anguis fragilus	x			x	
Ophisaurus apodus				x	x
Elaphe longissima				x	
Coluber gemonensis		x	x	x	
Natrix natrix	x				

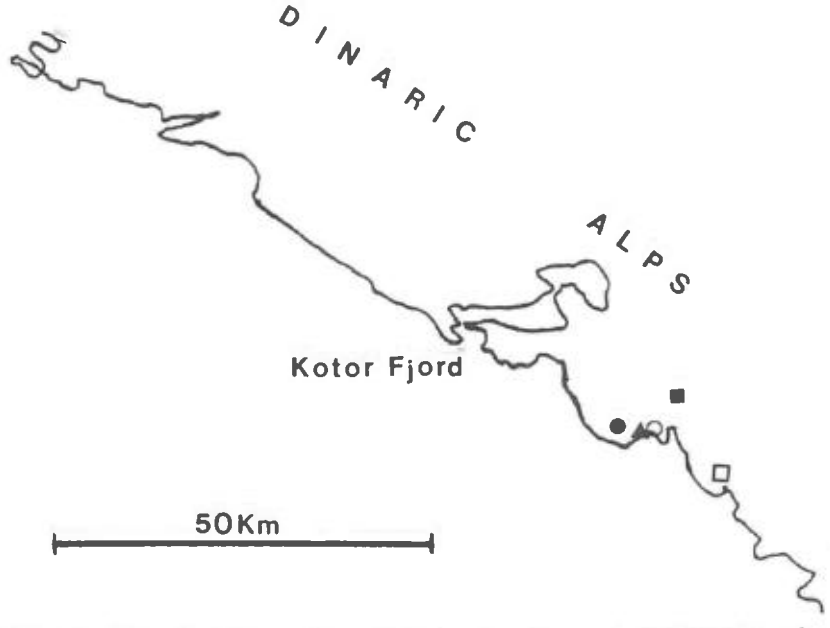

Fig. 1. A map of the coastline of Montenegro Yugoslavia showing site locations of area 1 (●), 2 (▲), 3 (■), 4 (○), and 5 (□).

Plate 1. View of part of area 1. In this section *Emys orbicularis, Mauremys caspica* and *Rana ridibunda* inhabited the ditches; *Podarcis mellisellensis* on the banks among vegetation. Other amphibians and reptiles were found on the marshy plain around the ditches (see text).

Plate 2. A view of part of area 4, showing a section with dense vegetation. *Testudo hermanni* and *Ophisaurus apodus* were the most frequently observed species in this type of habitat.

Plate 3. Adult *Mauremys caspica* observed basking beside a ditch in area 2.

Plate 4. Adult female *Ophisaurus apodus* found in area 4 showing extensive scale damage.

DISCUSSION

A total of thirteen species of reptile and four species of amphibian were observed in Montenegro. However, not all the species recorded from the areas surveyed were located. For example Mattison (1982) apparently found *Natrix tessellata* at a ditch in area 1 where he further observed two juvenile *Lacerta trilineata.* On site on the eastern side of the road in area 1 he also found *Ophisaurus apodus.* Mattison (1982) believed that *Rana esculenta* was present in area 1, but it would seem that the calls he heard were in fact from *Rana ridibunda.* Large numbers of anuran larvae were observed in areas 1, 2 and 4. The great majority of these had the characteristic dark appearance of bufonid larvae but a small number at area 1 appeared to be ranid.

REFERENCES

Arnold, E.N., Burton, J.A. and Ovenden, D.W. (1978). *A Field Guide to the Reptiles and Amphibians of Britain and Europe.* Glasgow and London; Collins.

Busack, S.D. and Ernst, C.H. (1980). Variation in Mediterranean populations of *Mauremys,* Gray 1869 (Reptilia, Testudines, Emydidae). *Annals of Carnegie Museum* **49** (17): 252-264.

Brelih, S. and Dzukic, G. (1974). *Catalogue Faunae Jugoslaviae Ljubljana.*

Mattison, C. (1982). Notes on some reptiles collected and observed in Yugoslavia. *Herptile* **7** (2): 21-25.

Meek, R. (in press). Thermoregularity behaviour in a population of Hermanns tortoise *(Testudo hermanni)* in southern Yugoslavia. *British Journal of Herpetology.*

Meek, R. and Inskeep, R. (1979). Observations on the herpetofauna of a coastal region of southern Yugoslavia. *Herptile* **4** (1): 18-28.

Meek, R. and Inskeep, R. (1981). Aspects of the field biology of a population of Hermanns tortoise *(Testudo hermanni)* in southern Yugoslavia. *British Journal of Herpetology* **6** 159-164.

Peaker, M. and Peaker, S. (1968). Spring herpetofauna of the Rovinj area (Istria, Yugoslavia) *British Journal of Herpetology* **4**: 36-37.

Thorpe, R.S. (1979). Multivariate analysis of the population systematics of the ringed snake *Natrix natrix* (L). *Proceedings of the Royal Society of Edinburgh* **78B** 1-62.

Thorpe, R.S. (1980). Racial affinities and geographical variation; a comparison of the use of multivariate morphometrics and conventional subspecies in relation to European reptiles. *In* J Coborn (Ed) *Proceedings of the European Herpetological Symposium C.W.L.P. Oxford 1980.*

BOOK REVIEW

A Provisional Atlas of the Amphibians and Reptiles of Essex
Essex Biological Records Centres Publication No. 2 (1983)
Woodgrange Press Ltd. 38 pp.

Colin Plant has compiled a welcome review of the current information on Reptiles and Amphibians in Essex. Distribution maps are set out on the monad grid divisions and are extremely useful in guiding the field herpetologist to both under-recorded areas, or recorded sites to check population status. While many of the maps clearly reflect the distribution of past recorders, the importance of this publication is that it provides a sound basis for future survey, in a field of natural history with growing interest. Few other Counties have produced such a comprehensive records review, and still lack the important focal point for County recorders.

Copies can be obtained at £1.30 inc postage and packing from:

The Passmore Edwards Museum, Romford Road, Stratford, London E15 4LZ

Tom Langton

MEMBERS' ADVERTISEMENTS

- **Wanted:** *Alytes obstetricans* and *Bombina variegata*. One breeding pair of each required. Also tadpoles of both species.
  Paul Bryce, 96 Shenstone Avenue, Stourbridge, West Midlands. Tel: Stourbridge 379157

- **Wanted:** Midwife toads and spadefoots. Buy or exchange for other European herps.
  Charles Snell, 76 Birdbrook Road, London SE3 9QP. Tel. 01-856 9852.

- **Wanted** for research into the allomentry of the limb bones of reptiles. The carcasses of lizards or crocodiles above 1kg. No legless forms.
  Please contact either Mr S. Pickersgill, Department of Pure and Applied Zoology, University of Leeds or Roger Meek, 8 Mountfield Road, Waterloo, Huddersfield.

- **Wanted:** Great Crested Newts, adults or young; Natterjack Toads, adults or young. To try to establish a garden colony.
  Roger Keay, 81 Beaumont Road, Bournville, Birmingham B30 2EB

- **For Sale:** 1984 Garter Snakes, 1982 *Bombina maxima.*
  Patrick Thorp, Beresford House, South Hill, Rolleston on Dove, Burton on Trent.
  Tel: Burton on Trent 812456.

- **For Sale:** Mangrove Snake. £15.
  Mike Soblicas. Tel. 01.539 8767.

- **For Sale:** captive bred baby Boa Constrictors. Also adult pair of Cooks Tree Boas.
  Simon Townson. Tel. 01-556 3373.

- **For Sale:** a 2-2½ ft African House Snake (*Boaedon fuliginosus*) and a 3½ ft Royal Pyton (*Python regius*) feeding. Sales due to departure to university.
  Chris Sluman, 18 Maltings Drive, Wheathampstead, Herts AL4 8QJ. Tel: Wheathampstead 2055.

- **For Sale or Exchange:** rarer forms of North American colubrid snakes in the genera *Elaphe, Pituophis* and *Lampropeltis*, including albinistic species and tri-colour *Lampropeltis* taxa from the Mexican interior. All specimens are quality captive bred hatchlings with both sexes available. Colour photographs and complete breeding history for all subspecies are available.
  Steve Osborne, 516 W. 8th Street, Edmond, Oklahoma 73034, U.S.A

BRITISH HERPETOLOGICAL SOCIETY COUNCIL 1984/85

Society address: c/o Zoological Society of London, Regent's Park, London, NW1 4RY

Members' private addresses:

President:	The Earl of Cranbrook	Great Glenham House, Saxmundham, Suffolk, IP17 1LP
Chairman:	Dr. M.R.K. Lambert	Flat 2, 34 Queen's Gate Terrace, London, SW7 5PH Tel: 01-589 3558 (Office: 01-937 8191 Ext. 205)
Membership Secretary/ Treasurer:	Mrs. M. Green	49 The Greenway, London, NW9 5AU Tel: 01-205 7635
Editor, *British Journal of Herpetology:*	Dr. R.A. Avery	Department of Zoology, University of Bristol, Woodland Road, Bristol, BS8 1UG Tel: 0272 24161 Ext. 314
Librarian & Co-Editor: *BHS Bulletin*	Mr. J. Pickett	84 Pyrles Lane, Loughton, Essex, IG10 2NW Tel: 01-508 6624
Chairman Captive Breeding Committee & Co-Editor, *BHS Bulletin*	Dr. S. Townson	"Wadley Warren", 10 Wadley Road, Leytonstone, London E11 1JF. Tel. 01-556 3373
Chairman, Education Committee (Junior Section)	Mr. V.F. Taylor	80 Curzon Avenue, Enfield, Middlesex, EN3 4UE Tel: 01-805 0745
Chairman, Conservation Committee	Prof. G.A.D. Haslewood	28 Old Fort Road, Shoreham-by-Sea, Sussex, BN4 5RJ Tel: 07917 3622
British Museum (Natural History) Representative:	Dr. C.J. McCarthy	Amphibian & Reptile Section, Department of Zoology, British Museum (Natural History), Cromwell Road, London SW7 5BD Tel: 01-589 6323 Ext 292.
European Observer:	Mr. K.F. Corbett	136 Estcourt Road, London, SE25 4SA Tel: 01-656 4383

Ordinary Members:

Dr. B. Groombridge (3rd year)
IUCN Conservation Monitoring Centre
219c Huntingdon Road
Cambridge, CB3 0DL
Tel: 0223 277314 and 277420

Dr. H.R. Bustard (2nd year)
Airlie Brae
Alyth
Perthshire PH11 8AX
Tel: 082 83 2501

Dr. T.J.C. Beebee (2nd year)
Biochemistry Laboratory
Biology Building
University of Sussex
Falmer
Brighton BN1 9NQ
Tel: 0273 606755 Ext. 51

Dr. G.J. Walters (3rd year)
6 Avon Road
Walthamstow
London E17 3RB
Tel: 01-521 0134

Dr. S.P. Gittins (2nd year)
University of Wales Institute of Science and Technology (UWIST)
King Edward VII Avenue
Cardiff CF1 3NU
Tel: 0222 42522 Ext. 388

Mr. K. Lawrence, MRCVS (2nd year)
(Vetrinary Adviser & Regional Liaison Officer)
23 Woodside Gardens
Chineham
Basingstoke
Hampshire
Tel: 025679 8061

Honorary Life Members (maximum 10):

Mr. A. Leutscher (1952), Mrs. M. Green (1960), Dr. J.F.D. Frazer (1982), Prof. A. d'A. Bellairs (1982), Prof. J.L. Cloudsley-Thompson (1983), Prof. R. Conant (1983), Dr. D.G. Broadley (1983), Prof. H. Saint Girons (1984).

INSTRUCTIONS TO CONTRIBUTORS

Articles, new items, notes and letters on any aspect of herpetology are needed for the Bulletin. Contributions should, if possible, be typed. Handwritten items should be clear and legible. All contributions should be double spaced and on one side of the paper only. They should be sufficiently presentable to be given directly to the printer. Contributors are urged wherever possible to follow the "Instructions to Authors" printed on the inside back cover of the British Journal of Herpetology. Photographs can be reproduced only from good quality black and white prints. Reprints of articles can be supplied to authors. These must be ordered from the Editors before the Bulletin goes to press.

CONTENTS

Printed by Metloc Printers Ltd., Old Station Road, Loughton, Essex